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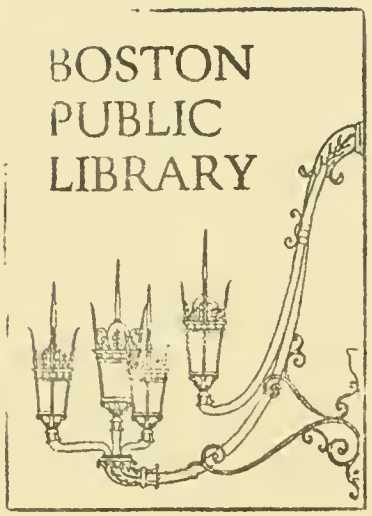
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Rowes Wharf Development

Volume One
Chapters I–V

BRA
59
Final
Vol. 1

Final Environmental Impact Report

Project Proponent:
Rowes Wharf Limited Partnership
an affiliate of
The Beacon Companies

Prepared by:
Skidmore, Owings & Merrill
Jason M. Cortell and Associates Inc.
Vanasse/Hangen Associates, Inc.
Tech Environmental
Wright Brothers Facility, M.I.T.
Hansen, Holley and Biggs Inc.

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* Appendices 2, 3, 5, and 7 are available for review at the Executive Office of Environmental Affairs' MEPA Unit and at the Boston Public Library. Individual copies of these detailed technical documents are available on request from Skidmore, Owings & Merrill (617-247-1070).

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I Summary

ROWES WHARF
DEVELOPMENT
(EOEA #4992)

This Final Environmental Impact Report (EIR) examines a No-Build alternative and a mixed-use development alternative for Rowes Wharf, in the City of Boston and Suffolk County. This site, comprised of Rowes and Fosters Wharves, is located at the southern terminus of Boston's Downtown/Waterfront Urban Renewal Area, and is owned by the Boston Redevelopment Authority (BRA).

Alternative 1 -- No-Build. Under this alternative, the existing structures and uses would remain unchanged. At present, the site consists of overgrown and deteriorating paved and decked areas, four trailers, two sheds, and dilapidated piers. The BRA leases portions of the site for parking (225 spaces) and commuter and excursion ferryboats. The two sheds are used to collect parking fees. Administrative, ticketing, and passenger-waiting functions related to the ferryboat operations are concentrated in the trailers. The remainder of the property is barricaded from the public due to its dilapidated condition. A continuation of this alternative will result in the further deterioration of the Wharf's substructure, eventually precluding utilization of the property for the existing uses.

Alternative 2 (Modified) -- Rowes Wharf Mixed-Use Development. This alternative entails the disposition of Rowes Wharf to the Rowes Wharf Limited Partnership, an affiliate of The Beacon Companies, for the establishment of an active mixed-use development on the Boston Waterfront. The project will include residences, offices, general retail and restaurant uses, an executive-suite hotel, a ferry terminal, a marina, a public dinghy dock, a public observatory overlooking Boston Harbor, public open space, parking, and auxiliary and related uses. This use program and overall site design are the culmination of many years of planning by public agencies and area citizens, and are consistent with the site redevelopment guidelines prepared by the BRA and the Boston Society of Architects (BSA). The project provides pedestrian and visual access to and along the water's edge; accommodates ferryboat uses and allows for their future expansion; creates a mixed-use development compatible with other waterfront uses; and provides a design that draws upon the waterfront's historic past.

This alternative is identified as "modified" because it includes three changes in design since the submission of the Draft EIR. These changes are detailed in the Notification of Project Changes submitted to the Secre-

tary of Environmental Affairs on June 7, 1984 (see Appendix 6) and include (i) an addition of one foot per floor, or 17 feet at the highest point of the structure, in order to accommodate a steel structural system; (ii) the relocation of all structures within the State Harbor Line and U.S. Pierhead and Bulkhead Line of 1940; and (iii) the reduction of parking spaces from 700 to 575.

The mixed-use development is the preferred alternative and is consistent with and complementary to site guidelines and policies developed by the BRA in the Urban Renewal Plan and during the Boston Harbor Plan process. In accordance with the Massachusetts Coastal Zone Management Program (CZM), the Rowes Wharf development will maintain public access to the coastal zone and will comply with all appropriate filling/dredging permit and licensing regulations. Furthermore, this project will reinforce the waterfront's role as a public place to visit and enjoy, providing a vital link in a growing network of pedestrian-oriented areas along the Harbor.

PROPONENT	Rowes Wharf Limited Partnership, an affiliate of The Beacon Companies (Hereafter referred to as the proponent.)
EIR STATUS	Final
SUMMARY OF ENVIRONMENTAL ISSUES	This Final EIR presents the contents of the Draft EIR with revisions based on project modifications made since the Draft's submission. These changes in the document are a result of refinements to the design and in response to comments and questions raised during the review process. Full responses to all review comments on the Draft EIR and the Notification of Project Changes are included in Volume Two, Chapter VI, of the Final EIR. In addition to revisions to the Draft EIR Chapters, new Sections on shadow and construction impacts have been added. The environmental effects of implementation of the mixed-use development alternative and of the No-Build alternative are briefly described below. Chapter IV: Environmental Issues, Chapter VI: Comments and Responses, and the Appendices should be referenced for a more detailed discussion of these issues.

Traffic and Parking

The parking program in the Final EIR is 575 spaces, a reduction from the maximum program of 700 spaces analyzed in the Draft EIR. As a result, the parking program described has been revised, but the traffic flow networks, which were analyzed for the maximum case of 700 spaces, were retained. The traffic study included capacity analyses of three intersections: Atlantic Avenue and Northern Avenue, Atlantic Avenue and India Street (East India Row), and the intersection of the Surface Artery with High Street. In addition, areawide impacts were considered.

A trip-generation estimation indicated 2,780 new daily vehicle trips to and from the site. During the AM peak hour, 254 new vehicle trips are projected, while during the PM peak hour, there will be 297 trips. In the morning peak hour, operating levels of service will not change due to the project. In the PM peak hour, the only change anticipated in level of service is at India Street and Atlantic Avenue. While the intersection level of service will be reduced in the PM peak hours, it will remain within a range acceptable for urban conditions. At the Atlantic Avenue and Northern Avenue intersection, capacity operations are expected with or without the project and little incremental effect is anticipated from this project.

The parking analysis indicated that by the horizon year (1987), the available area parking supply of 11,000 spaces may be reduced by nearly 4,000 spaces. In this event, the continued provision of 225 public spaces at the Rowes Wharf site will help to provide parking for public waterfront attractions.

Although the project is expected to have minimal effect on levels of service, mitigation measures could be applied to reduce overall congestion in the area. These measures include: elimination of parallel parking along the site frontage on Atlantic Avenue, provision of space for a taxi drop-off and pick-up area, installation of a signalized pedestrian crossing on Atlantic Avenue, implementation of peak-period parking restrictions on Atlantic Avenue north of the site, and encouragement of vanpool and carpool programs to reduce vehicle trips.

During the project's construction phase, it will be necessary to utilize a portion of Atlantic Avenue to construct a slurry wall foundation and provide sufficient room to construct the building. A traffic control plan has been developed that maintains vehicular and pedestrian capacity throughout the construction periods. This plan has been developed in consultation with the Boston Department of Traffic and Parking and received conceptual approval. It will maintain the existing number of travel lanes in front of the site and will feature police officer traffic control and other special provisions for safety.

Air Quality

The air quality analysis was based on a parking program of 700 spaces. Although the parking program has been reduced to 575 spaces, the original analysis has been retained since even for the maximum case, there was no violation of state or national standards.

Ambient air quality was assessed by performing a microscale analysis of carbon monoxide (CO) concentrations at three nearby roadway intersections and in public areas adjacent to the exhaust vents for the underground garage. The analysis examined existing (1984) conditions as well as the No-Build and mixed-use development alternatives in the horizon year (1987).

Modeling results indicate maximum 1-hour and 8-hour CO concentrations will be below the Massachusetts and National Ambient Air Quality Standards (NAAQS) for both the No-Build and project alternatives. This assumes the Commonwealth's Inspection and Maintenance Program for light-duty vehicles, initiated in April 1983, continues to be enforced. It can be concluded from these results that the proposed development will not interfere with the attainment and maintenance of the NAAQS for CO.

Visual Quality and Urban Design

The proposed design for the mixed-use development conforms to guidelines formulated by the BRA and BSA. These guidelines were based on the waterfront design goals of the 1979 Boston Harbor Plan.

Impacts of the proposed project on the visual environment were analyzed through a series of eye-level views. This analysis found that the proposed project improves public accessibility to the water's edge through visual and physical connections, continues the walk-by-the-sea and various water-related activities, and complements the character of the local architecture through the building material, massing, and facade treatment.

Continuing design development efforts and meetings with community groups have resulted in design modifications that expand the central arch and provide more extensive views to the water from Broad Street and all other approaches to the site.

Wind

A full analysis of wind conditions on Rowes Wharf and vicinity using both hot-wire and erosion tests was conducted by the Wright Brothers Facility at MIT in collaboration with Hansen, Holley & Biggs Inc. Two sets of comfort criteria were adopted for evaluation of the results of the wind tunnel tests. The first is a guideline used by the BRA which sets a threshold for effective peak gusts which should not be exceeded more than one percent of the time. The second is an international published standard compiled by W. H. Melbourne which sets categories of relative comfort for pedestrians.

Results of this evaluation, applying both erosion and hot-wire tests, show no exceedances of the BRA Guideline or the more restrictive Melbourne criteria on the Rowes Wharf site and no significant exacerbation of wind conditions in the surrounding area. Overall, conditions are slightly windier on the site as compared with the existing vacant site. Conditions at windy areas at Harbor Towers and near 400 Atlantic Avenue are slightly improved by the Development.

Shadow

The effects of projected shadows were analyzed for three principal areas--(i) Atlantic Avenue and the Custom House District, (ii) public plaza areas of the project, and (iii) Harbor Towers--at the fall and spring equinox, the summer solstice, and the winter

solstice. The analysis revealed that Atlantic Avenue will be in shade in the morning and sunlight in the afternoon throughout the year. Shadows will extend to the edge of the Custom House District only on late fall and early winter mornings. Most of the Rowes Wharf public area will receive sunlight during part of every day, with the longest periods of sun on summer days. Most of the Harbor Towers site will be in full sunlight throughout the summer and shaded in limited areas in the winter and on spring and fall mornings.

Water Quality, Dredging, and Filling

The discussion of water quality presented in the Draft EIR has been revised to reflect refinement of project plans and comments of permitting/review agencies and public interest groups, and to incorporate new analyses of both marine sediment and upland excavation quality. The proposed project plan provides for the complete redevelopment of the Rowes Wharf site. Most of the existing filled land is to be excavated for subsurface parking. An entirely new bulkhead is to be constructed in the approximate location of the existing seawall, and existing deteriorated piers and decking are to be replaced by new wharf structures. Dredging of 9,000-10,000 cubic yards (cy) of marine sediment over a one-acre area will be required for the marina and to provide access for the construction barge.

The material to be dredged consists of contaminated, Category 3, Type C sediment. Bioassay/bioaccumulation analysis of this material indicates it is acceptable for disposal at the Massachusetts Bay Foul Area. Consultation with the Army Corps of Engineers for the permitting of the proposed dredge and disposal activities is underway.

Excavation of the main foundation area will require removal of 125,000-150,000 cy of material. Disposal will take place at a coastal area landfill because bulk chloride concentrations in the excavated material exceed the 250 mg/kg limit established by the Department of Environmental Quality Engineering (DEQE). A suitable disposal location is being determined in coordination with DEQE.

Minimal water quality impacts will result from removing existing piles, seawalls, and timber deck; installing a new bulkhead and piles; dewatering; and dredging. The

existing piles will be entirely removed from the sediment within a floating boom and the new nondisplacement piles driven. Requirements for dewatering the foundation hole will be minimal since the deep slurry-wall and "up-down" construction methods will reduce lateral groundwater seepage and accumulation of rainwater. Dredging, over two one-month periods, can be anticipated to produce turbidity conditions similar to a severe coastal storm. At the limits of the plume, suspended solids of less than 5 mg/l are anticipated. While such concentrations are not expected to impact adjacent water users (the New England Aquarium and Hook Lobster Company), the entire dredge area will be enclosed within silt curtains and monitoring will be conducted at Hook because filtration is not available there as it is at the New England Aquarium. If unacceptable concentrations are detected, further mitigation measures will be considered, including a silt curtain around Hook's intake filtration systems, and dredging on the ebb tide if feasible. Upon completion of the project, a foundation underdrain system will discharge uncontaminated groundwater to the Harbor. No significant impacts on Boston Harbor biota are anticipated.

Water-Related Activities

The marine activities incorporated into the proposed development, as part of an agreement between the BRA and the proponent, serve the public interest by continuing water-borne access to the Rowes Wharf area of Boston Harbor. A ferry terminal, designed to expand with demand, and new, high-quality loading areas should make ferryboat services more attractive to potential users. In the marina, containing approximately 50 slips, one-half of the slips will be made available to the transient general boating public, and a public dinghy dock will be provided for mariners who anchor in the Harbor.

While these facilities help to implement the City's future plans for the Harbor, there is some immediate effect on the federally designated Special Anchorage Areas located in navigable waters southeast of the Rowes Wharf site. The proponent, in consultation with the U.S. Coast Guard and the Boston Harbormaster, has proposed a reconfiguration of the Special Anchorage Area B adjacent to the Anchorage Areas northeast of the site.

Construction

Construction, anticipated to begin in late 1984, with completion in 1987, will occur both landside and waterside. Measures to mitigate impacts that may result from construction are planned for each operation. Three major innovative construction techniques will be used to shorten the building period, reduce construction-related traffic, and lessen the impacts on water quality and nearby structures: the slurry wall system, the "up-down" method of construction, and the use of preassembled steel structural framing and wharf systems.

The effect of construction-related traffic on Atlantic Avenue, the only roadway access to the site, will not be significant given the existing volume of traffic on the avenue. During construction of the slurry wall, a portion of Atlantic Avenue will be closed off. A traffic control plan that maintains vehicular and pedestrian capacities has been developed.

The slurry wall and "up-down" construction methods will help mitigate impacts on water quality by eliminating ground water seepage and reducing rainwater accumulation in the excavated area. Mitigation measures to deal with the turbidity levels will include the use of driven rather than jetted piles, silt curtains, floating booms, and monitoring. With the "up-down" method, the ground floor will be put in place early, greatly reducing the area subject to wind erosion. The remaining open area can be watered to prevent fugitive dust emissions.

Construction is planned from south to north so that ferry services can be permanently established at the new floating dock at the south wharf by mid-1985. A phased ferryboat relocation plan is being proposed that will allow the ferry operators to maintain the present level of service throughout the late 1984 and early 1985 construction operations.

Coordination to alleviate possible impacts from contemporaneous activities is being planned with nearby projects whose construction schedules overlap with the Rowes Wharf Development.

II Project and Area Description

PROJECT DESCRIPTION

The parcels comprising Rowes Wharf were acquired by the Boston Redevelopment Authority (BRA) as part of the Downtown/Faneuil Hall/Waterfront Urban Renewal Plan. Located at the southern terminus of this Renewal Area, the 5.38-acre parcel of land and water is bounded by the Boston Inner Harbor, the 400 Atlantic Building, Atlantic Avenue, and the Harbor Towers Development. Figure II-1 indicates the location of the Rowes Wharf project site.

Historically, the Wharf played an important role in maritime use of the port for military, cargo, and passenger service. Presently, the site is dominated by overgrown, deteriorating paved and decked areas, trailers, sheds, and dilapidated piers. Weakened portions of the Wharf have been fenced from the public. Current site uses include parking and an embarkation/disembarkation point for commuter and excursion ferryboats.

The proposed action consists of disposition of the Wharf to the proponent for a multi-building, mixed-use development. A structure adjacent to Atlantic Avenue will include office, retail, residential, and hotel uses, and underground parking. Two protected and three open public entrances, including a grand central court, will provide access to the site and the water, and a public observatory will overlook Boston Harbor. Wharf-like residential structures, containing commercial uses on the first-floor, will extend along finger piers into the water and reflect the style of existing residential areas to the north. A ferryboat terminal, with indoor and outdoor waiting areas and a floating dock, will be the focal point of site waterside uses. Marina docks, accommodating approximately 50 slips, will extend from the tips of the piers and will cluster within the inlets. Half of the marina slips will be reserved for public/transient users. A public dinghy dock will be provided, creating a new shoreside access point for the Special Anchorage Areas located northeast of the site. Approximately 2/3 of the project will be devoted to public open space, including water, walkways, plazas, and landscaped areas, inviting access through the site and along the full water perimeter.

Retail establishments and restaurants will line the more active walkways. Vehicular access will be from Atlantic Avenue, with parking for 575 cars and all service areas and loading docks provided below grade on five levels.

Figure II-1

USGS Location Map

As noted above, the majority of the site will be devoted to public open space. The remaining third of the property will contain approximately 665,000 square feet of program area devoted to mixed uses located above grade. Total development costs are estimated at $180 million.

Construction is scheduled to begin in the last quarter of 1984 with completion scheduled for 1987.

Project Benefits

The proposed Rowes Wharf project reflects close attention to the goals, objectives, and guidelines for the revitalization of downtown Boston established by the Downtown/Faneuil Hall/Waterfront Urban Renewal Plan and the Boston Harbor Plan. These plans are responsive to economic, visual, and social needs of Boston and the New England Region, as well as the legal requirement that the use of tidelands serve a public purpose.

The 1979 Boston Harbor Plan provided specific guidelines for redevelopment of the Rowes and Fosters Wharves. Based on this plan, the BRA/BSA design team prepared specific objectives for the redevelopment of this site. Those guidelines recommend a high density, active development containing a mix of uses including residential structures, parking, open spaces, a water transportation terminal, and other water-dependent uses.

In addition, the Legislature established specific public purpose requirements for the redevelopment of the site in Chapter 704 of the Acts of 1983, enacted to remove certain title questions that would impair redevelopment of the Rowes Wharf site. Chapter 704 requires construction and continued existence of certain defined maritime facilities--including a ferry terminal, a marina with half of the slips for public/transient users, and a public dinghy dock--in conjunction with a mixed-use development.

The redevelopment plan for Rowes Wharf meets these guidelines and requirements and will transform an unsafe and blighted area into an economic, recreational, and visual resource for the City and the region. A summary of project benefits follows:

- Estimated development costs of $180 million, creating between 600 to 800 construction jobs each year of the construction period.

- Creation of approximately 1,300 jobs, associated with the ongoing operation of the mixed-use development.

- Increased economic activity, with stimulating effect on other local businesses.

- Transformation of an unattractive, dilapidated portion of the waterfront into an active mixed-use project, sensitive to the visual qualities of surrounding environs.

- Improved public access to the waterfront, continuing the walk-by-the-sea along the site's perimeter.

- Provision of open space, devoting approximately 2/3 of the site to public area.

- Improved pedestrian safety and access through modifications to traffic patterns and pedestrian crossings on Atlantic Avenue.

- Enhanced water-related activities through development of a marina, with half of its slips reserved for the transient general boating public, a public dinghy dock, and improved ferryboat facilities, including provision of an enclosed passenger waiting area.

- Elimination of public safety hazards through reconstruction of the dilapidated Wharf.

AREA DESCRIPTION

The Rowes Wharf site is situated at the southern end of the Downtown Waterfront development area, where it meets the neighboring districts along the Fort Point Channel and the South Boston Waterfront to the east. Located at a curve in Atlantic Avenue and the Central Artery, the Wharf is highly visible from major regional approaches. From the west, it is also a focal point of pedestrian routes through the Financial District and the Broad Street Area to the Harbor.

As a crossroads site, the plans for the Rowes Wharf Development have been influenced by the character of the various surrounding districts or neighborhoods. The historic pattern of development, the major changes that have occurred with redevelopment and new development over the last ten years, and the anticipated new projects in the vicinity establish the context for the development of Rowes Wharf and the analysis of its environmental effects. This surrounding context is described below and illustrated in Figure II-2.

Downtown Waterfront

Historically, the Downtown Waterfront consisted of a concentration of commercial structures related to maritime trade, associated businesses, and passenger service. Over the last 10 to 15 years, the waterfront has been transformed by major public and private redevelopment actions featuring a diversity of activities. The overall context for the Rowes Wharf Development is a vital, active mixed-use area of high-quality residences, professional offices, hotels, retail establishments, and public uses such as the New England Aquarium. Many of these uses are housed in older commercial, often wharf-like structures, which have been adapted for reuse. New structures typically have been designed to complement the older style in massing or materials. Maritime uses consist primarily of private sailing clubs and commuter and excursion ferryboat operations.

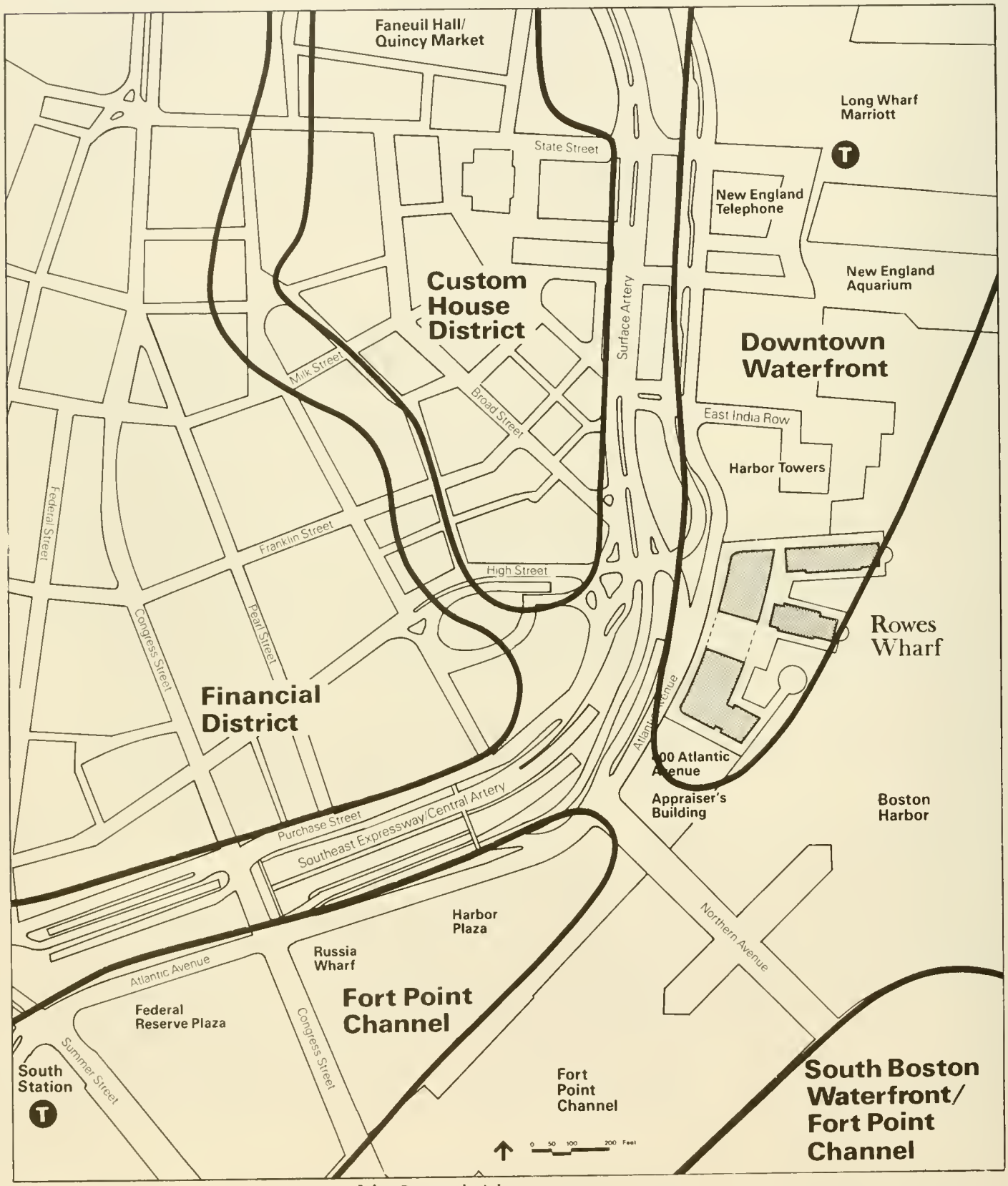
The immediate setting for the Rowes Wharf site, at the southern end of this waterfront renewal area, includes a private residential complex to the north (Harbor Towers) and two newly renovated office buildings to the south (400 Atlantic and the GSA Appraiser's Building).

Fort Point Channel

The area of larger-scale commercial structures that lines the Fort Point Channel is also a neighbor of the Rowes Wharf site. 400 Atlantic and the Appraiser's Building in the Downtown Waterfront are more typical of the Fort Point Channel buildings that have been renovated for high-quality office use in an area extending from Rowes Wharf to the Federal Reserve Bank. Renovation and new construction on the east side of the Channel also reflect this office use, with a limited

Figure II-2

Surrounding Districts



number of residential and public uses (Museum Wharf) located in the area as well. The Channel itself is accessible to some marine uses such as commercial fishing and private boating.

Broad Street District

The Broad Street office/commercial district is located across the regional highway corridor (Central Artery, Surface Artery, Atlantic Avenue), 300 to 400 feet from the Rowes Wharf site. This district is characterized by older brick commercial structures and several distinguished landmark buildings such as the Batterymarch Building on Batterymarch Street, the Grain Exchange Building on Milk Street, and the Custom House Tower at the far end of the district. This area was designated as the Custom House Historic District in 1973.

Financial District

The Financial District abuts the Broad Street area and is located across the Central Artery, 300 to 400 feet from the Rowes Wharf site. This district's central focus is Post Office Square, but it has been growing in the direction of the waterfront, with major new projects undertaken in the last five years. The area is characterized by high-rise office towers, high employment density, and the highest public-transit ridership in the region. The proposed new development at the Fort Hill garage site and adjacent parcels would add approximately 1.8 million square feet of Financial District office space directly across the Central Artery from the Rowes Wharf site.

South Boston Waterfront

The South Boston Waterfront development area extends from the Fan Pier Area (Piers 1, 2, and 3), across the Fort Point Channel from Rowes Wharf, east to Castle Island. As a potential development area of approximately 600 acres, this district is expected to include:

- Industrial, commercial, fishing industry, and office uses related to Economic Development Industrial Corp. (EDIC) and Massport properties.

- o BOSCOM, a computer and communication trade mart at Commonwealth Pier.

- o Hotel, office, restaurant, retail, and residential development located in vacant parcels near the Fort Point Channel.

At present the area is largely vacant with low-intensity uses on most parcels and extensive at-grade parking facilities used by downtown commuters. By 1987, a portion of the new industrial and urban mixed-use developments is assumed to be in place. These future assumptions are outlined below.

Future Development in the Area

The analysis year for the Rowes Wharf EIR is 1987, the point at which the project will be substantially completed and occupied. For the purpose of environmental analyses, certain assumptions had to be made as to changes in the surrounding area that would affect the base case for 1987. To accomplish this, previous environmental studies of the area were reviewed, developers in the area contacted, and City approvals reviewed.

With the approval of the MEPA staff, the 1987 assumptions used for the South Boston waterfront area are fully consistent with recent EIRs for proposed development in the area (specifically for Commonwealth Pier and EDIC's Boston Marine Industrial Park). This includes full development of Piers 1, 2, and 3, although it appears that this project will not be complete by 1987. This full-build assumption has been used to assure a conservative traffic-base assumption.

Highlights of the assumed 1987 development setting include:

- o Rowes Wharf Development completed.

- o International Place (Fort Hill Associates) under construction (existing parking removed).

- o New Northern Avenue Bridge completed.

- o BOSCOM in operation.

- Piers 1,2, and 3 completed (1,000 housing units, 1,000-room hotel, office, and other development), as shown on the Commonwealth Pier and EDIC background data for previous EIRs.

- Further development of Boston Marine Industrial Park and Army Base.

The environmental characteristics of the immediate and surrounding project areas are described in detail in Chapter IV of this EIR. This includes a review of traffic and parking, air quality, visual quality, wind, shadow, water quality, water-related activities, and construction.

PERMITS

In conjunction with the submission of this EIR, the proponent is submitting applications for the following permits and licenses.

Federal

- U.S. Army Corps of Engineers, Federal Clean Waters Act Permit; Rivers and Harbors Act Permit.

- U.S. Environmental Protection Agency, N.P.D.E.S. Discharge Permit.

State

- Massachusetts Executive Office of Environmental Affairs, MEPA Certification.

- Massachusetts Office of Coastal Zone Management, Determination of Consistency.

- Massachusetts Department of Environmental Quality Engineering, License for new structures (Ch. 91); Dredging and Dredged Material Disposal Permit (Ch. 91); Approval of Floats and Rafts; Water Quality Certification; Surface Water Discharge Permit; New Sources of Air Contaminants Review; Sewer Connection Permit.

- Massachusetts Historical Commission, Determination of Effect to Historic Properties.

- Metropolitan District Commission, Industrial User Discharge Permit.

Local

- o Boston Conservation Commission, Wetlands Order of Conditions.

- o Municipal operating permits, including zoning approval, already received.

III Description of Alternatives

Program uses and general design objectives for Rowes Wharf evolved from many years of planning by the Boston Redevelopment Authority (BRA), including the Urban Renewal Plan and the 1979 Boston Harbor Plan. Specific program and design guidelines were prepared in conjunction with the Boston Society of Architects (BSA) and were issued in 1982 by the BRA as a Request for Proposals (RFP) for redevelopment of the Rowes Wharf site. After a year-long competition between a number of development groups, the proponent was designated the developer by the BRA in May 1983.

In full compliance with the Massachusetts Environmental Policy Act, the following steps preceded the submission of this Final Environmental Impact Report (EIR).1/

o Environmental Notification Form	November 23, 1983
o Scoping Meeting	December 9, 1983
o Certificate of the Secretary of Environmental Affairs Requiring an EIR and Defining the Scope	December 23, 1983
o Draft Environmental Impact Report	March 30, 1984
o Public Informational Meeting Held by the Proponent	May 1, 1984
o Certificate of Adequacy of the Draft EIR by the Secretary of Environmental Affairs	May 16, 1984
o Notification of Project Changes	June 7, 1984
o Letter from Secretary of Environmental Affairs Accepting the Notification of Project Changes	July 3, 1984

1/ The Environmental Notification Form (ENF) and the Secretary's Certificate requiring an EIR and defining the scope are included in Appendix 1. The Certificate of Adequacy of the Draft EIR and the letter from the Secretary approving the Notification of Project Changes are presented in Chapter VI of the EIR. Appendix 6 includes the Notification of Project Changes.

The Final EIR analyzes two alternatives for the redevelopment of Rowes Wharf. These alternatives and the range of issues examined are based upon the EIR Scope Memo issued by the Secretary of Environmental Affairs in response to the ENF, as well as additional comments made by the Secretary in the Certificate of Adequacy of the Draft EIR and by representatives of public agencies and interest groups responding to the Draft EIR (see Chapter VI: Comments and Responses). Alternative 1, the No-Build, assumes no significant change in the Wharf's present use. Alternative 2 details the proposed mixed-use development.

In the following Chapter, the alternatives are described in terms of the potential impact areas set forth in the Scope Memo and the Certificate of Adequacy of the Draft EIR. These include (i) Traffic and Parking; (ii) Air Quality; (iii) Visual Quality and Urban Design; (iv) Wind; (v) Shadow; (vi) Water Quality, Dredging, and Filling; (vii) Water-Related Activities; and (viii) Construction.

ALTERNATIVE 1: NO-BUILD

The No-Build Alternative assumes the continuation of Rowes Wharf's present uses, with no reconstruction of the Wharf or improvement to existing structures. Current uses of parking and commuter and excursion ferryboats would continue in the short-term.

However, the continued deterioration of the pier structure could preclude the parcel's continued utilization for such operations in the future. Figure III-1 presents current views of the site.

The existing licenses for parking on the site allow for 225 public spaces. Marine functions include year-round commuter ferryboat runs between Hingham on the South Shore and Rowes Wharf. Excursion ferries operate during the summer months. Structures associated with these uses include (i) two sheds housing ticketing operations for parking and (ii) four trailers used for administrative, ticketing, and passenger-waiting functions related to the ferryboat operations.

The present on-site boat operators are Mass Bay Commuter Services, Inc. (MBCS), Mass Bay Lines, Inc. (MBL), and Boston Harbor Commuter Services (BHCS). Currently BHCS and MBCS each operate one high-speed commuter boat, and BHCS has recently purchased another boat that should be put into service this summer. MBL has four ferries that provide excursion and charter services

Figure III-1

Rowes Wharf Today

primarily and limited weekday commuter runs. MBCS's and BHCS's sublicense agreements with the Massachusetts Executive Office of Transportation and Construction allow use of the site for "docking commuter vessels to allow commuter passengers to embark and disembark." MBL's "use and occupancy agreement" is with the BRA. No long-term leases are presently available to these operators.

Currently, the site is underutilized, devoted solely to parking and commuter and excursion boats. The public is unable to walk safely near the water's edge, and no public space or walkways invite the active use and enjoyment of the site by pedestrians. Furthermore, the Wharf currently detracts from the visual appeal of the waterfront, and it is not consistent with the pattern of rebirth which has characterized the Harborfront over the last years.

Under the No-Build Alternative, the continued deterioration of the Wharf will make it unuseable for land and water activities. The costs of this option include the loss of revenues, which more intensive site use would generate; limited public access to this portion of the waterfront; the continued presence of a public safety hazard; and the eventual displacement of a public transportation service.

ALTERNATIVE 2 (MODIFIED): ROWES WHARF MIXED-USE DEVELOPMENT

This development project and recreational resource, proposed by the proponent, will establish an active mixed-use development on the Boston waterfront (see Figure III-2). Nearly 2/3 of the site will be devoted to public open space including water, plazas, landscaped areas, and walkways along the parcel's entire perimeter. Approximately 665,000 square feet of program area will be constructed above grade. Specifically, structures adjacent to Atlantic Avenue will contain office, residential, retail, and hotel uses. Two protected entrances and three open public entrances, including a grand central court, will provide access through and along this structure to the site and the water's edge. Wharf-like residential structures, with some commercial uses on the first floor, will extend along finger piers. Retail establishments and restaurants will line the most active walkways.

Figure III-2

Proposed Development Project

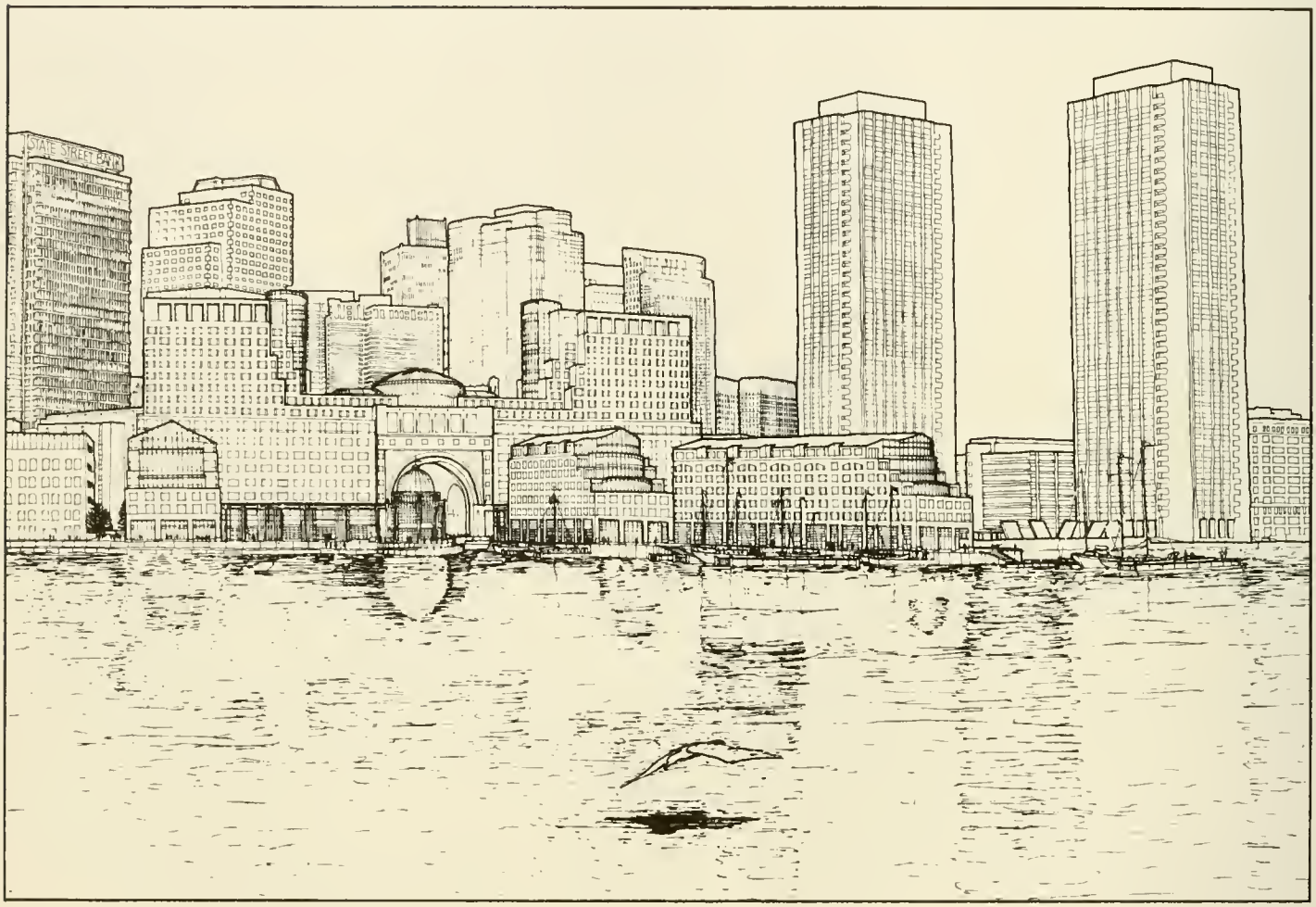
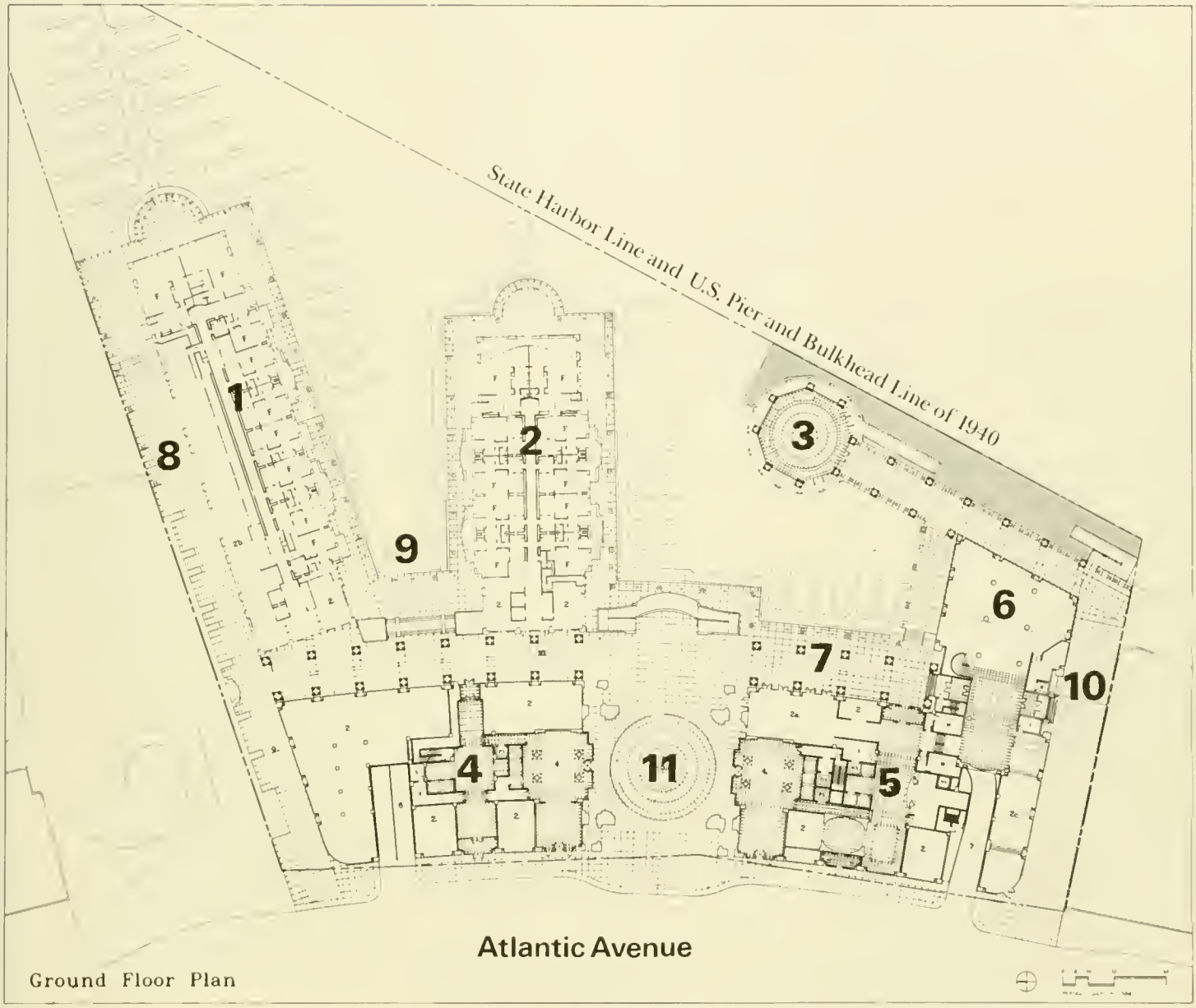


Figure III-2 con't.

Proposed Development Project



1. Residential/Commercial (North Wharf)
2. Residential (Central Wharf)
3. Ferry Terminal/Boarding Area
4. Office/Residential
5. Office/Executive Suites
6. Restaurant/Office/Ferry Terminal
   Future Expansion Area (South Wharf)
7. Rowes Walk
8. Northern Promenade
9. Dinghy Dock
10. Southern Promenade
11. Central Arch/Public Observatory (above)

Commercial and recreational marine uses will be more effectively accommodated by this development. Piers will be reconstructed, eliminating the current safety hazard. For the ferryboat operations, an upgraded terminal has been planned that includes a 2,500 square foot, enclosed waiting and passenger service/ticketing area; an additional 5,500 square feet of space in the south wharf building available for terminal expansion and for offices, storage, and employee facilities if needed; and a custom-designed floating dock for ferryboat landings. In addition, a marina, consisting of approximately 50 slips, will be developed, with docks extending from the tips of the piers and clustering within the inlets. The marina's slips will be equally split between transient and permanent users. Finally, parking for 575 cars will be provided below grade on five levels. A site plan that indicates existing and proposed conditions is included in Chapter IV of this report (see Figure IV-36).

This alternative is referred to as "modified" as it includes three changes outlined in the Notification of Project Changes submitted to the Secretary of Environmental Affairs on June 7, 1984 (see Appendix 6). To summarize, these modifications entail:

Height Change. A change in the proposed type of construction from concrete to steel resulted in an increase of approximately one foot per floor for the built areas of the project. Maximum height increase (in two locations along Atlantic Avenue) will total 17 feet or a change from a 165-foot height to 182 feet to the top of the roof slab of the upper-most inhabited floor. However, there will be no additional stories or floor area. This change in height does not alter the findings of the original EIR assessment and the Secretary of Environmental Affairs found this change did not warrant rescoping.

Site Plan Modification. The proponent altered the project configuration in response to comments by the Secretary of Environmental Affairs and other parties. This modification includes:

- All project structures and maritime facilities are now contained west of the State Harbor Line and the U.S. Pierhead and Bulkhead Line of 1940 in non-navigable waters.
- The public dinghy dock has been relocated to the inlet between the north and central piers.

o The marina is redesigned to provide individual slips. A major goal of these changes was to improve navigational safety.

Parking Reduction. The Draft EIR analyzed the impacts of a maximum number of parking spaces (700) in order to present a worst case analysis. Since that time, the total number of spaces has been reduced to 575. As noted by the Secretary, this reduction is seen as a "beneficial impact of the project."

These changes were reviewed by the BRA/BSA review team (see Attachments 1, 2 and 3 of Appendix 6), the public, and the Secretary of Environmental Affairs, and were found by the Secretary to have no additional significant impacts.

The approximate distribution of program area by use is as follows:

o Residential Condominiums (160-165 units)	225,000 SF
o General Retail	14,500 SF
o Retail/Restaurant	15,500 SF
o Office	265,000 SF
o Hotel (200 units including 7,500 SF of small meeting rooms)	130,000 SF
o Health Club	15,000 SF
Total Program	665,000 SF

Other major site uses include:

o Ferry Terminal	2,500 SF (5,500 SF reserved for future use as required)
o Marina	Approximately 50 slips
o Parking	575 spaces
o Public Open Space	2/3 of site

As noted in Chapter II, project construction is slated to begin in the last quarter of 1984, with completion scheduled for 1987.

IV Environmental Issues

INTRODUCTION

The following environmental issues are discussed in connection with the No-Build and project alternatives for Rowes Wharf, pursuant to the Scope Memorandum (see Appendix 1) and the comments of the Secretary of Environmental Affairs and representatives of public agencies and interest groups regarding the Draft EIR as well as the Notification of Project Changes (see Chapter VI).

- o Traffic and Parking
- o Air Quality
- o Visual Quality and Urban Design
- o Wind
- o Shadow
- o Water Quality, Dredging, and Filling
- o Water-Related Activities
- o Construction

Chapter IV: Comments and Responses presents detailed responses to comments and questions raised by reviewers of the Draft EIR and the Notification of Project Changes regarding the above environmental areas.

Traffic and Parking

INTRODUCTION

The Draft EIR analyzed a maximum case of 700 parking spaces on the project site and found no significant environmental impacts. Subsequent to the Draft, a final parking program of 575 spaces was established as a result of discussions with the Air Pollution Control Commission (APCC) and the Boston Redevelopment Authority (BRA). This reduced program formed the basis for the application to the APCC and was reported to the Secretary of Environmental Affairs in the Notification of Project Changes submitted June 7, 1984 (see Appendix 6). In conversations with the MEPA staff, it was determined that because the environmental assessment for the maximum case indicated no significant impacts on the roadways, the analysis contained in the Draft EIR would adequately address the reduced parking program. This section, therefore, has been modified to describe revisions to the parking program based on the reduction in spaces. However, the traffic flow networks as analyzed for 700 spaces are retained. Points raised by MEPA for further clarification have been responded to in Chapter VI: Comments and Responses.

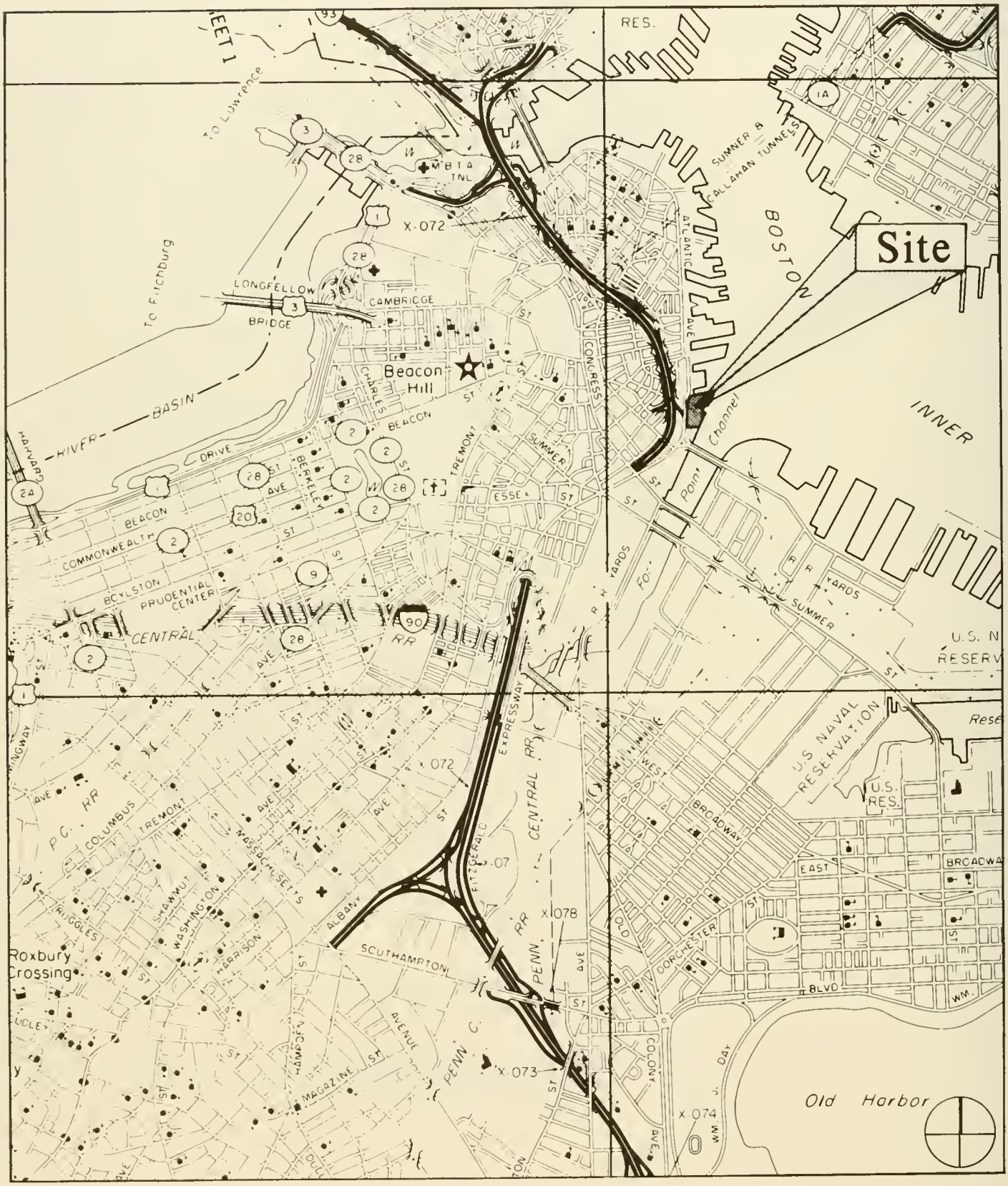
This Section on Traffic and Parking presents a summary of the transportation analysis carried out for the No-Build and project alternatives. It includes a description of the existing transportation system in the study area, an estimation and evaluation of probable project impacts, and an identification of mitigating measures to help reduce project impacts. Additional descriptions, data, and computations are presented in Appendix 2, which is available upon request.

The primary objective of the transportation analysis is to estimate and evaluate travel demands created by the proposed Rowes Wharf development. These estimated demands were compared to base conditions expected by the completion year of 1987 to determine probable impacts of the project.

The transportation analysis study process was carried out in three basic tasks:

1. Description of the Environment - This task measured existing transportation conditions at the site and on adjacent roadways in the study area.

Site Location Map



2. Probable Impacts of the Project - The second task forecasted transportation demands generated by the proposed mixed-use project, as well as forecasts of traffic generated from other anticipated land development in the study area. These forecasts were then compared with system capacity to identify potential problem areas and needs. It was found that all intersections studied would experience increases in traffic volumes. One of the unique features of the site location is that all entering traffic has to pass through the Northern Avenue/Atlantic Avenue intersection, while all exiting traffic would be required to pass through the East India Row/Atlantic Avenue intersection. It was found that background traffic demands would be considerably greater than those created by the project itself.

3. Measures to Mitigate Environmental Impacts - The last task in the study process identified opportunities to alleviate transport impacts created by the development. Several mitigating measures were identified including: implementation of a pedestrian crossing signal on Atlantic Avenue, use of management personnel to control on-site traffic, implementation of a construction-phase traffic control plan on Atlantic Avenue, and ride sharing.

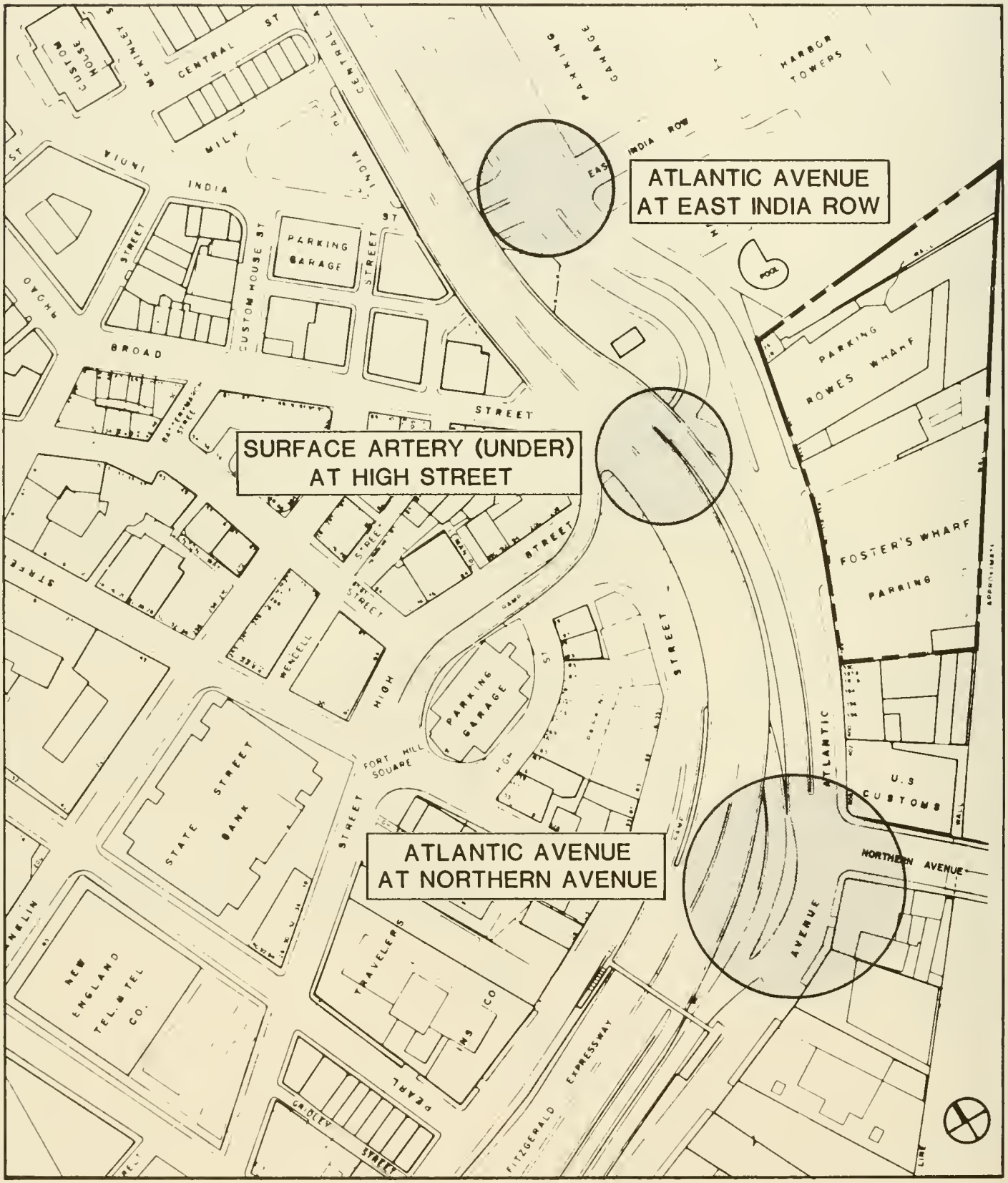
DESCRIPTION OF THE ENVIRONMENT

Identification of the Study Area

As identified in the scoping decision, the traffic study includes the intersections of Atlantic Avenue with Northern Avenue and India Street (East India Row), and the intersection of Surface Artery with High Street (see Figure IV-1). Project impact will be greatest at these three intersections and for this reason they were selected for further analysis. Also considered were the traffic-generation characteristics of the existing parking facilities on the site. The site is the location for two major parking facilities which are currently licensed for 225 spaces.

Figure IV-1

Location of Intersections



Data Collection

Data was collected to determine existing transportation conditions in the study area. Daily and peak-hour traffic data, from other projects recently completed in the area, as well as additional traffic data were gathered. Other information assembled included: roadway geometrics, traffic control device locations, and transit data. The data collection phase of the project provided considerable detailed information regarding travel characteristics within the study area. This information is briefly summarized in the following subsections.

Existing Conditions

Atlantic Avenue is a wide one-way northbound street (three to four travel lanes) between Kneeland Street and High Street and a two-way street north of High Street. At the site, the northbound direction is split by a large traffic island with traffic on the west side of the island allowed to access High Street and the Surface Artery/Purchase Street. North of High Street, Atlantic Avenue intersects India Street at the Harbor Towers condominium development.

The intersection of High Street/Surface Artery/Atlantic Avenue is signal controlled as is the intersection of Atlantic Avenue/India Street. The intersection of Northern Avenue and Atlantic Avenue is currently unsignalized.

Traffic Volumes

Traffic data was taken primarily from previously collected information, particularly that collected during the development of base traffic conditions for the Third Harbor Crossing/Depressed Central Artery project (EOEA #4325). AM and PM peak-hour volume information was available at the Surface Artery/High Street intersection and at the Northern Avenue/Atlantic Avenue intersection. Additional counts were conducted at the India Street intersection to complete the development of the base conditions.

The table following Figures IV-2 and IV-3, summarizes existing daily volume information available for Northern Avenue and Atlantic Avenue, in relative close proximity to the site. It indicates that Atlantic Avenue, south of Northern Avenue, carries 16,900 to 17,050 vehicles per day on an average weekday. Northern Avenue typically carries 18,050 to 20,560 vehicles per day at the Fort Point Channel bridge. Peak hour traffic data for these streets indicate that 7 to 11 percent of the daily volume is carried during each peak hour.

Figures IV-2 and IV-3 present the existing AM and PM peak periods. The directional flow of traffic varies on the area streets during the peak hours. Atlantic Avenue is a one-way northbound street and carries its heaviest volumes during the PM peak hour. Approaching the High Street intersection, volumes are heaviest on the northbound Artery off-ramp during both the AM and PM periods. Southbound volumes on the Surface Artery are highest during the PM peak.

EXISTING DAILY TRAFFIC VOLUME SUMMARY

	AWDT[1/]	Source
Atlantic Avenue between Summer and Congress Sts.	16,900	Third Harbor Tunnel EIS/EIR - 1982 data
Atlantic Avenue between Congress St. and Northern Avenue	17,050	Building 114 EIR (EOEA #4427) - 1981 data
Northern Avenue at Fort Point Channel	18,050	Third Harbor Tunnel EIS/EIR - 1982 data
Northern Avenue at Fort Point Channel	20,560	Building 114 EIR (EOEA #4427) - 1981 data

1/ AWDT - Average weekday daily traffic.

Transit Service

The Massachusetts Bay Transportation Authority (MBTA) currently operates one bus route that passes the site on Atlantic Avenue. This route, identified as Route 6, only provides local rush-hour service between the South Boston Army Base and Haymarket Station. During the rush hours, buses operate on 15-minute headways.

Figure IV-2

Base A.M. Peak-Hour Volumes

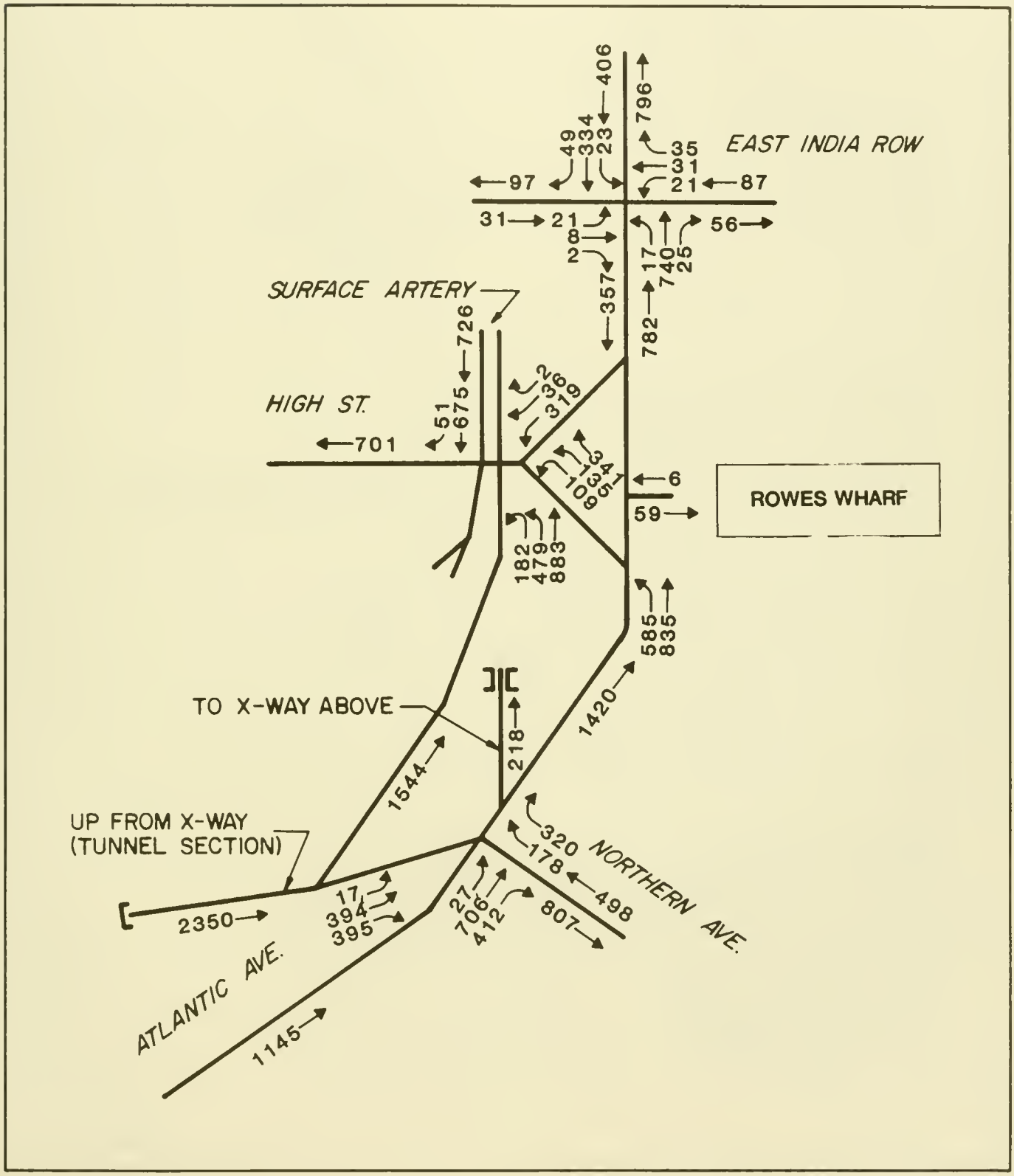
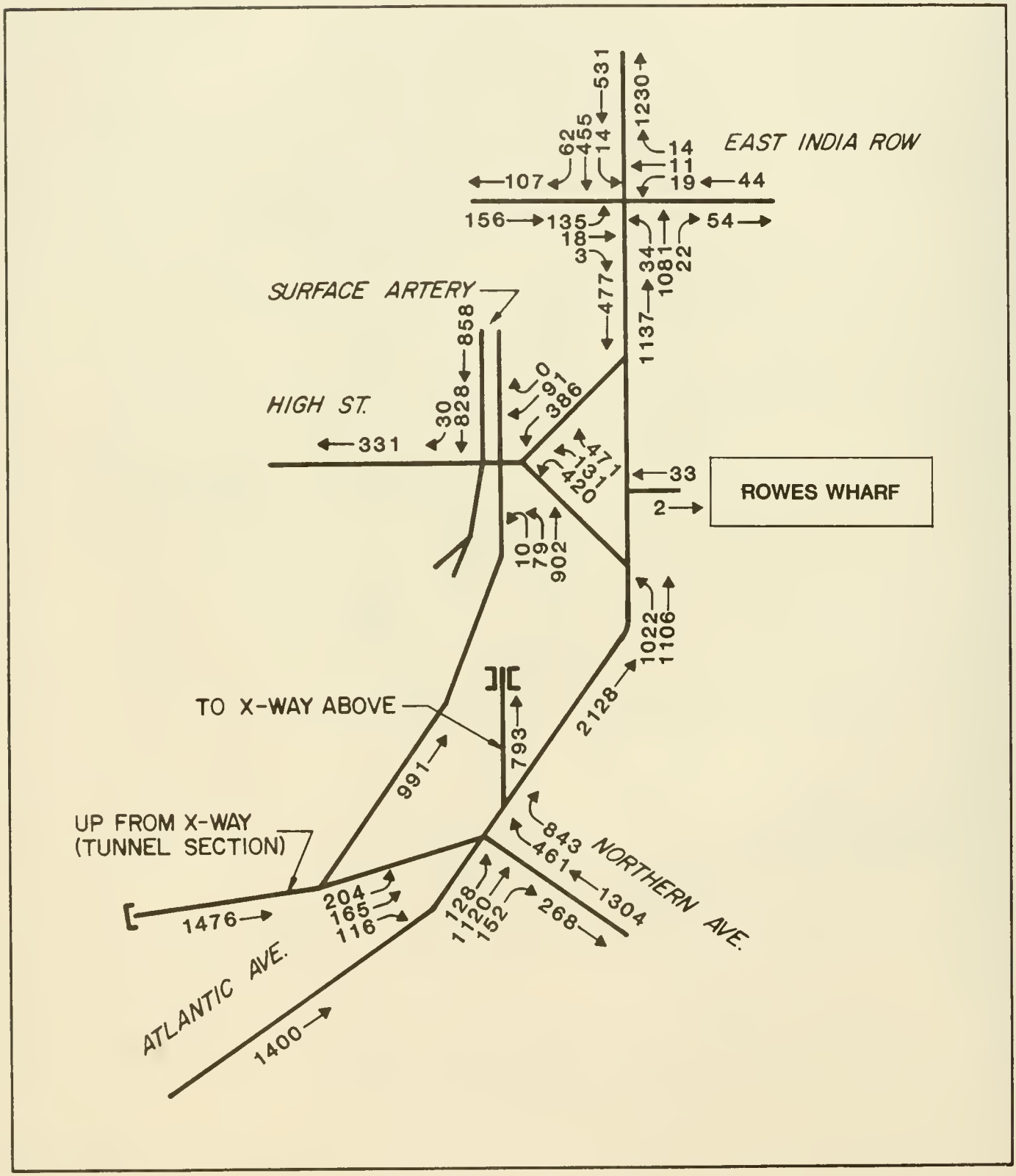


Figure IV-3

Base P.M. Peak-Hour Volumes



The Rowes Wharf site is also situated at a fairly convenient location from which to access the MBTA's regional rapid transit system. As shown on the MBTA system map (see Figure IV-4), the closest station is the Blue Line Aquarium Station, which is approximately 800 feet north of the site. Other stations which would serve commuters and residents at the site include South Station (Red Line and commuter rail), State Street (Orange and Blue Lines), Haymarket (Green and Orange Lines, North Shore express buses) and North Station (Green and Orange Lines, commuter rail).

Pedestrian Activity

The sidewalk along the east side of Atlantic Avenue enables access for pedestrians from several directions. Pedestrian points of entry into the Rowes Wharf area include South Station via the MBTA Red Line, Aquarium Station served by the MBTA Blue Line, and the large parking areas in South Boston's Fort Point Channel area. From these points, morning commuters will walk to the Quincy Market/Long Wharf area, the area which includes 470 Atlantic Avenue, Russia Wharf, and the Federal Reserve Building, as well as those offices west of the Central Artery accessible from High and Broad Streets. These few pedestrian points of entry into downtown and concentrated office/recreation areas illustrate only some of the pedestrian routings incorporating Atlantic Avenue.

During the peak commuting hours, the Atlantic Avenue sidewalk experiences a constant pedestrian flow while during off-peak periods, intermittent flow generally occurs.

Because no marked crosswalk exists on Atlantic Avenue between Northern Avenue and India Street, pedestrian crossings occur along the length of this long block with the heaviest concentrations at the northern end of the site. Once across Atlantic Avenue, pedestrians can cross the Surface Artery/High Street intersection with the existing signal phasing. The two primary pedestrian corridors which pedestrians use to penetrate the Financial District are from this intersection to either High Street or Broad Street.

Figure IV-4

MBTA Regional Rapid Transit System

PROBABLE PROJECT IMPACTS

Base Traffic Conditions

To accurately assess the impact of the proposed development, it is necessary to define the future roadway conditions considered for analysis. Because the implementation year for this project (and analysis condition) is 1987, the existing roadway configuration will be essentially maintained. The proposed Central Artery Depression/ Third Harbor Tunnel project will not be completed at that point and is, therefore, not considered in the analysis. The only change anticipated for the immediate study area is the relocation of the Northern Avenue bridge. For purposes of this analysis, it was assumed that the new bridge would be constructed parallel to and just south of its current location. Further, it was assumed that the Northern Avenue/Atlantic Avenue intersection would be signalized as has been proposed.

Background Traffic Growth

There are several planned building programs and rehabilitations at other locations in the study area which are expected to generate new traffic. To be consistent with previous EIRs conducted for projects in South Boston, the base development assumptions were accepted and used as described previously. Specific projects, which were included under the background growth in previous reports, include completion of the proposed mixed-use development (1,000 hotel rooms, 1,000 housing units, 800,000 square feet of office, and 100,000 square feet of retail uses) on Piers 1, 2 and 3; completion of the BOSCOM computer and communication trade mart; increased housing and office use along Congress Street; renovation of Building 114 at the Boston Army Base for a Garment Center and other uses; and increased warehousing and industrial activity at the Boston Marine Industrial Park (BMIP).

Although it now appears unlikely that full development of these major projects will be realized by 1987, these assumptions were maintained for consistency with other recent studies. As a result, the 1987 No-Build Alternative can be seen as a conservative, worst-case assumption for intersections such as Northern Avenue and Atlantic.

In addition to the listed projects, there are a number of other developments which are currently in the planning stages and could affect traffic patterns in the area. For example, the proposed International Place project on the site of the existing 650-space Fort Hill garage will likely be under construction in 1987. Similarly, the sites of the existing 950-space Post Office Square garage, the large Piers 1, 2 and 3 parking lot, and the 400-space Kilby Street garage may be under construction, effectively reducing the area's parking supply. Since the reduction in available parking would most likely lead to fewer vehicle trips to those destinations, it is reasonable to assume that under 1987 conditions, overall traffic volumes in the area, related to those uses, would be lower. To be conservative, however, no reductions were applied, effectively creating a worst-case scenario.

Background traffic was estimated for this background development using two sources (i) the Institute of Transportation Engineers (ITE) report "Trip Generation"[1/]; and (ii) person-trip rates for various land uses which were presented in the Parcel 1B, Harvard Square Draft EIR and Final EIR (EOEA #3176).

Person-trips were changed to automobile trips by applying transit use factors (modal split) and car occupancy rates for each land use category. Modal splits were estimated for each of the subareas studied, primarily as a function of the level of transit service available in each subarea and the type of land use proposed.

Once estimated, the background traffic was assigned to the existing roadway network volumes to create the 1987 No-Build conditions. The No-Build networks serve as the basis of relative project impacts.

Trip Generation Analysis - Rowes Wharf

The proposed Rowes Wharf development consists of the following land use program:

1/ Institute of Transportation Engineers, Trip Generation, An Informational Report, Washington, D.C., 1975, Rev. 1979.

o Hotel	130,000 S.F.
o Office	265,000 S.F.
o Residential	225,000 S.F.
o General Retail	14,500 S.F.
o Restaurant	15,500 S.F.
o Health Club	15,000 S.F.
Total	665,000 S.F.

As part of the proposed development, a 2,500 square-foot enclosed, ferry waiting area, with potential expansion of 5,500 square feet, will be provided. Also proposed are two transportation facilities -- a 575 space parking garage (representing a net reduction of 125 spaces from the 700 studied in the Draft EIR) and a marina, containing approximately 50 slips. These land uses and ITE's Trip Generation report were the basis for the estimation of vehicle trips generated by the proposed Rowes Wharf development. A description of the considerations made for each land use follows.

Hotel

The proposed hotel will differ from most hotels in the City because the 130,000 square footage will be divided into suites. There will be approximately 200 units which provide a living area in addition to the standard bedroom. The units will generally be occupied for a longer period than standard hotel rooms with stays on the order of three days rather than more typical single night stays. Therefore, check-in and check-out activity will be reduced from a standard hotel. There will be no major meeting or banquet facilities provided in the hotel.

In response to comments on the Draft EIR, a survey of the nearby Hotel Meridien was undertaken to determine travel characteristics of a downtown hotel. Based on the survey, an estimate of 10 person-trips per room per day was developed. Although results at the Meridien were considerably lower, it was conservatively estimated that 25 percent of all guests will use a personal automobile[1/] and 25 percent will use taxis for their travel.

1/ Only 10 percent of the guests at the nearby Hotel Meridien on Franklin Street use hotel parking for private automobiles.

This estimate, based on the Meridien survey, represents a reduction from the 55 percent taxi usage presented in the Draft EIR. The remainder of the guests will likely walk or use transit, given the hotel's proximity to the business district, social establishments, recreational areas, and the subway.

Taxi and private auto usage were also considered separately. Employees were assumed to take transit or walk (total 50 percent) while the remainder were assumed to drive. Private auto occupancy rates of 1.4 people per vehicle and 1.5 people per taxi (pick-up or drop-off) were utilized. Overall, traffic generation for the hotel would be 980 vehicle-trips per day, a reduction of 190 trips from the 1,170 presented in the Draft EIR.

Office

According to a recent parking study of the Boston downtown area[1/], up to 40 percent of office trips are typically made by automobile. It was also found that the average vehicle occupancy is two persons per vehicle. These figures indicate considerably fewer automobiles are generated by office space in downtown Boston than would be indicated by using the ITE nationwide rates. Other studies in the area have utilized auto usage percentages of 10-30 percent. Based on the reduced amount of parking available under the current project configuration, standard ITE trip rates were adjusted to account for 35-percent automobile usage and an average auto occupancy rate of two people per vehicle rather than the standard 1.2.

Residential

It is expected that the trip-generating characteristics of the planned 165 condominium units will be very similar to that observed at the neighboring Harbor Towers condominiums. Proximity to the potential workplace,

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1/ Parking in Central Boston: Meeting the Access Needs of a Growing Downtown, Boston Traffic and Parking Department, Cambridge Systematics and Vanasse/Hangen Associates, Inc., December 1983.

restaurants, and shops will discourage use of an automobile for many trips. A comparison was made between ITE rates for a high-rise apartment and actual traffic generation at Harbor Towers. It was found that the Harbor Towers rates are approximately half that identified by ITE. As a result, a set of adjusted ITE rates were utilized with the result being an estimate of approximately 40 to 50 peak-hour residential trips from this project.

Restaurant

Total restaurant area includes a hotel lobby bar of 2,200 square feet, a coffee shop of 3,000 square feet, and a high-quality restaurant of 7,250 square feet (370 seats), with an associated bar/waiting area of 3,050 square feet.

The 370-seat restaurant is expected to be used by hotel guests for at least one of their evening meals during the course of their stay. The coffee shop and lobby bar are expected to be patronized primarily by site users. As a result, new traffic expected to use the main restaurant was the only component expected to create any significant traffic.

Retail

The shops to be included as the project's retail element are relatively small in size and are intended to serve the office and residential population on site. As a result, it is not expected that the retail component will contribute significantly to traffic generated by the project and no traffic generation associated with this use was identified.

Health Club

Similar to the proposed retail uses, the health club is planned as part of the internal services provided for residents, area employees, and hotel guests. As a result, no additional traffic generation related to this project component was identified.

Marina

While half the slips in the marina will be made available to project residents, the other half will be reserved for public/transient users. Therefore, trips to the marina have been estimated. Standard ITE rates were used to develop the daily and peak-hour traffic generation related to this component.

Ferry Terminal

There is currently no significant peak-hour vehicular activity associated with the ferry terminal and it was assumed that this would likely continue in the future. As a result, no new traffic generation for this project component was identified.

Parking

Public parking will represent only a portion of the total parking spaces provided. The actual breakdown of the proposed 575 spaces is as follows:

Condominiums	170 reserved spaces
Office/Hotel	180 reserved spaces
Public	225 spaces
Total	575

The parking program was established assuming the following: one space per residential unit, plus 5 visitor spaces; one space per 1,500 square feet of office space, to be shared with hotel guests; and 225 public spaces which will be used by restaurant patrons, visitors to surrounding public attractions, marina users, and the general public.

The 180 spaces reserved for office/hotel use would likely be available after normal working hours as shared spaces for other site users including hotel guests and visitors to the residents. Presently, the land on which the proposed development is to be built includes two public surface lots licensed to accommodate 225 cars.

In order to estimate the traffic generation expected from public parking, counts were taken at the existing surface lots. Both entering/exiting traffic was counted and spot accumulation counts were conducted. It was observed that between the hours of 8:00 AM and 6:00 PM, a total daily volume of approximately 475 vehicle-trips occur on the existing site. Based on data collected in February 1984 (when the actual available supply on site was less than the licensed 225 spaces due to construction), it was determined that during the PM peak hour (4:30 to 5:30 PM) a total volume of approximately 43 trips are generated by the exiting public parking. The two lots currently show a moderate amount of turnover, with vehicles observed entering and exiting throughout the day.

In order to be licensed to continue to provide 225 public spaces in the Development, it will be necessary for the project proponent to obtain a parking freeze permit. Under the Downtown Boston "Parking Freeze," the permit is required to operate any commercial parking establishment. A ceiling of approximately 35,000 "public spaces" is all that is allowed in the City. The permit issued by the Boston Air Pollution Control Commission must be applied for and a hearing held. The Commission must approve a permit for a total of 225 public spaces and has full discretion as to how to allocate the existing 225 spaces which are licensed on the Rowes Wharf site. In addition, the Commisson will need to confirm that 350 reserved spaces are exempt from the parking-freeze regulations. The Commission will require that the proponent develop operating procedures to assure that the reserved (exempt) and public (commercial) spaces be limited to their respective intended users, that the spaces designated exempt be limited to site users, and that the rate structure for the public spaces will discourage long-term parking. The proponent has applied for this permit, and a public hearing to consider the application was held on July 11, 1984.

Total Traffic

The table on the following page was developed to summarize new traffic impacts created by the project. The table indicates Daily, AM and PM peak-period new vehicle trip generation. Under the revised trip generation

analysis, the table indicates that the hotel will be the largest component on a daily basis followed by the restaurant, office, and residential portions of the project. The largest peak-hour traffic generating components are the office and hotel uses. As shown, the project is expected to generate 2,780 new daily trips (vs. 3,340 in the Draft EIR) and 254 to 297 new peak-hour trips.

Trip Distribution

In the previous discussion, the quantity of new vehicle trips, either arriving at or departing from Rowes Wharf was discussed. This subsection illustrates the assumptions made in regard to the general origin and destination of these trips.

NEW VEHICLE TRIP GENERATION SUMMARY
ROWES WHARF

	Hotel	Office	Residential	Restaurant	Marina	FEIR Total	Draft EIR[1/]
Daily	980	610	510	620	60	2,780	3,340
AM Peak							
In	52	107	14	--	12	185	240
Out	27	11	25	--	6	69	81
Total	79	118	39	--	18	254	321
PM Peak							
In	34	14	25	31	10	114	126
Out	35	99	25	19	5	183	226
Total	69	113	50	50	15	297	352

1/ These volumes have been superceded by the current analysis presented in this Final EIR.

Similar to previous EIRs for the project area, traffic is expected to be primarily oriented to three cardinal directions: north, south, and east. Because of the constraints created by the existing roadway system, all

drivers must make their final approach from the south, regardless of which regional routing they took to reach the project area. Therefore, traffic will enter the project site via Atlantic Avenue. Traffic was assigned to each approach at the Northern Avenue/Atlantic Avenue intersection so that the total volume approaching the site would equal the new trip generation.

To exit the site, all traffic must turn right on Atlantic Avenue to reach the India Street intersection. At this point, drivers will choose which direction to travel. Northbound traffic will likely continue north on Atlantic Avenue. Regional traffic to the south would turn left at India Street and left again onto Surface Artery in order to reach the Southeast Expressway. Regional traffic to the west would likely split, and it was therefore assumed that half of the westbound traffic would use the Southeast Expressway to reach the Mass. Turnpike and half would use Storrow or Memorial Drives. These assumptions were used to develop the exiting patterns for the site.

Future Volume Networks

Trip generation characteristics presented above result in an overall reduction in traffic volumes of 16-21 percent over volumes predicted in the Draft EIR. Though the reductions will mean somewhat less impact from the project, the calculated level of service at the intersections studied will not change as a result of these small reductions in peak-hour volumes. AM volumes are 67 trips lower under the Final FIR analysis while the PM volumes are 55 trips lower. The analysis presented herein is therefore based on the Draft EIR trip generation and represents a maximum case traffic analysis for the project. The 1987 No-Build and Build networks from the Draft EIR are presented as Figures IV-5 to IV-8.

Level of Service Analysis

The reported traffic volumes on the study area streets give no indication of the quality of traffic flow. To measure quality of flow, intersection capacities were analyzed at the three study area intersections for the

Figure IV-5

1987 No Build A.M. Peak-Hour Volumes

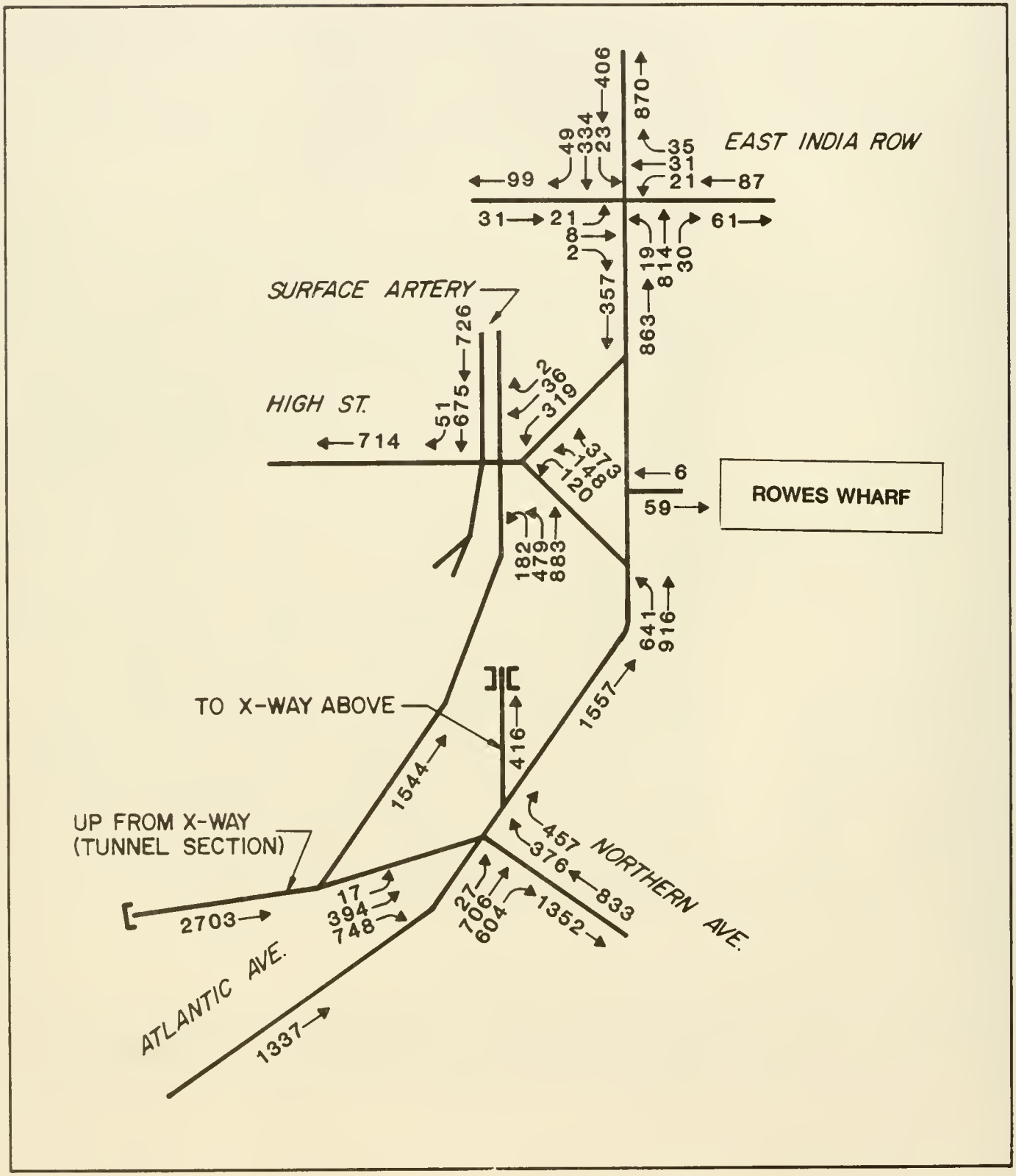


Figure IV-6

1987 Build A.M. Peak-Hour Volumes

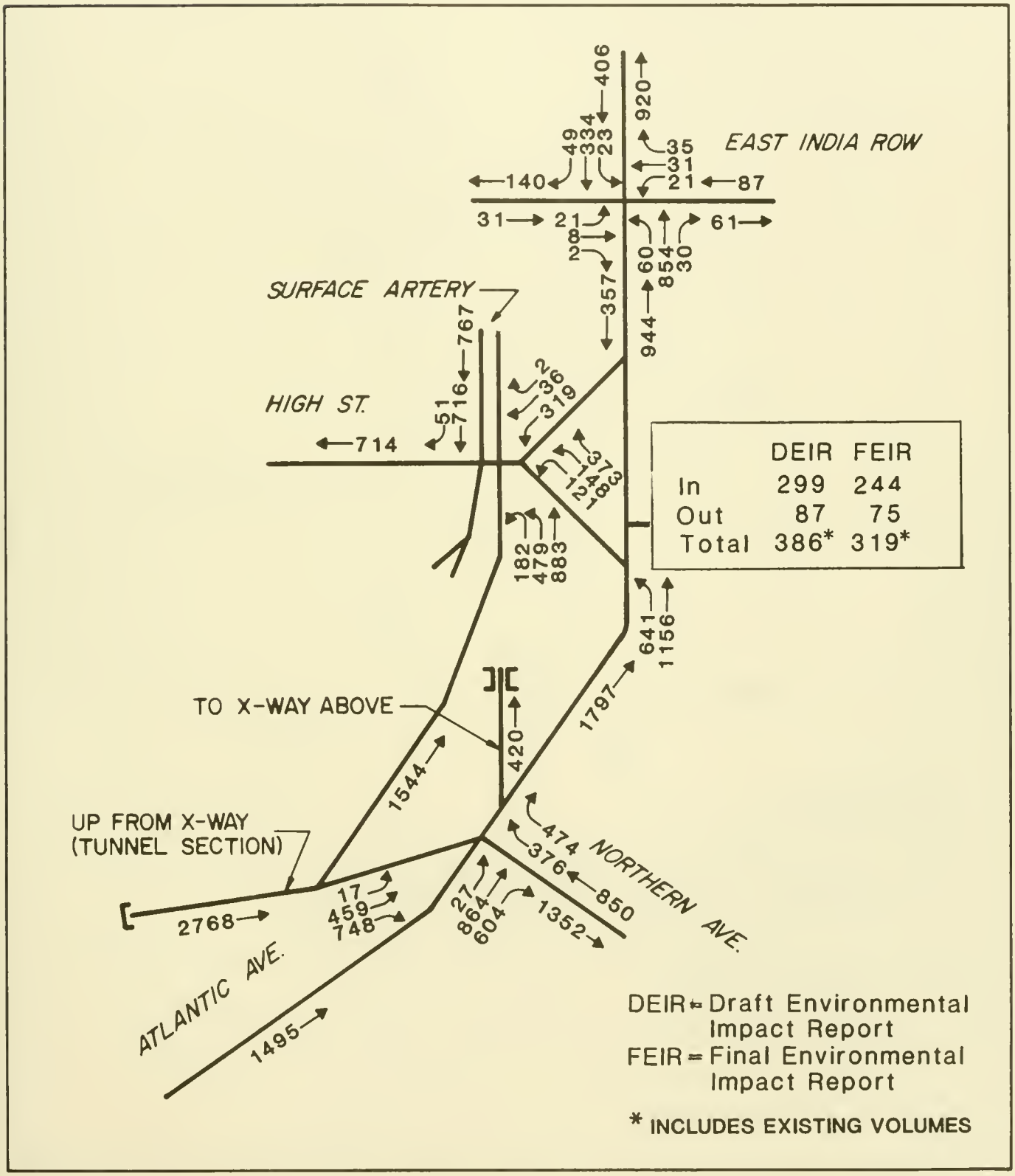


Figure IV-7

1987 No Build P.M. Peak-Hour Volumes

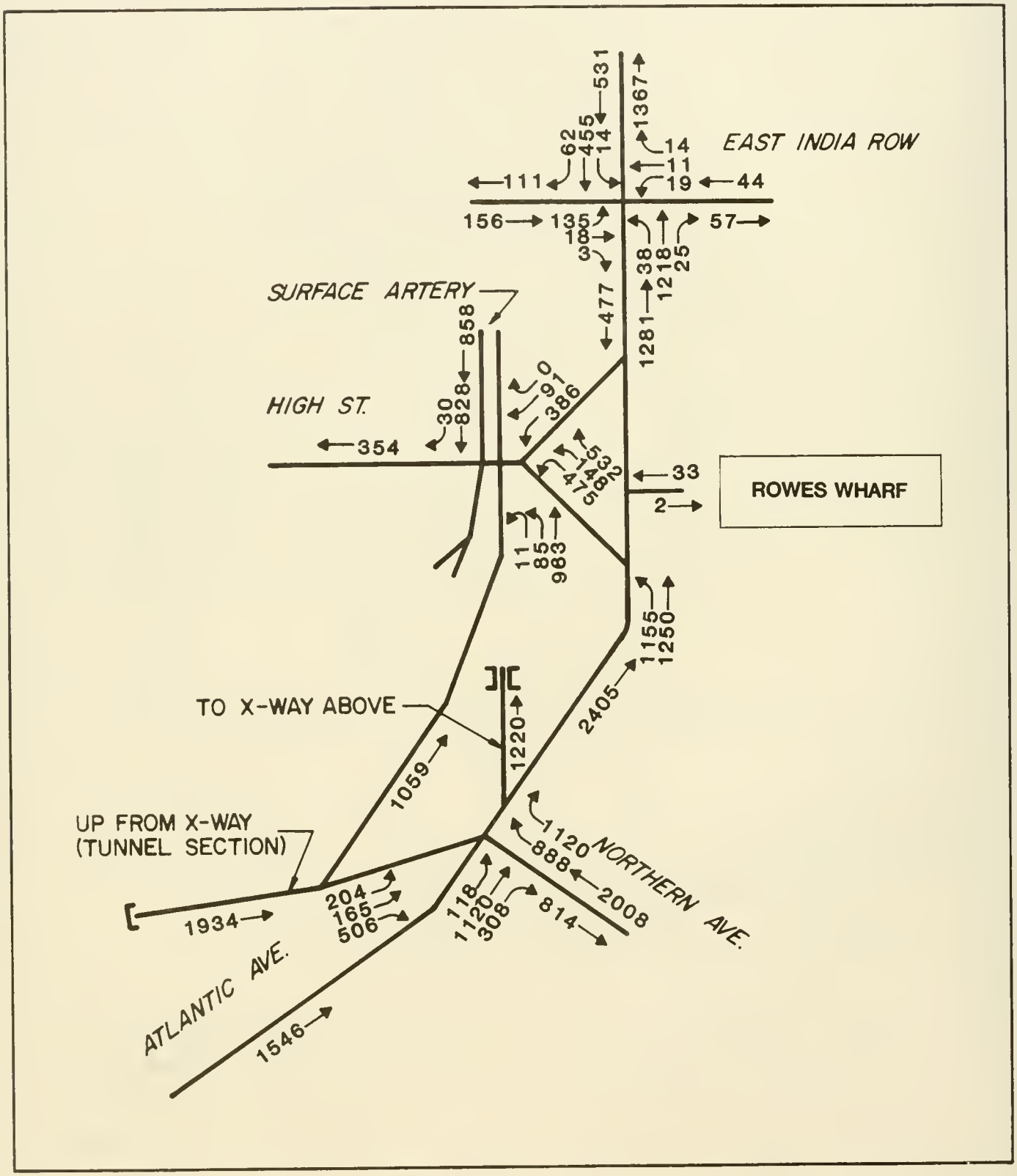
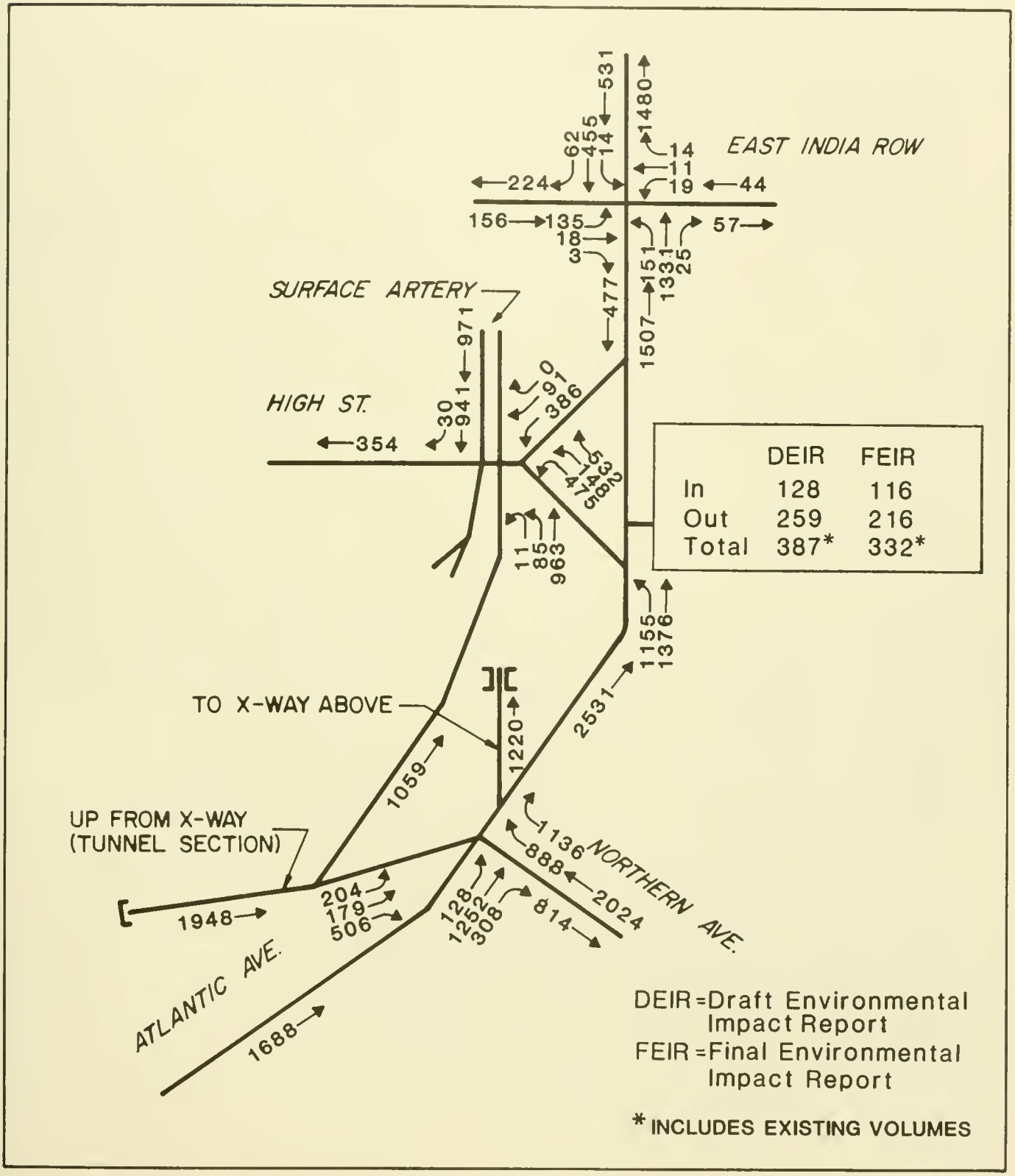


Figure IV-8

1987 Build P.M. Peak-Hour Volumes



base traffic volume network, the 1987 No-Build, and the 1987 Build networks. It should be noted that the project's impacts are not confined to these three intersections, they simply represent locations where the impact of the project was anticipated to be greater and therefore was measured and analyzed.

To measure the operating conditions at the selected intersections, the level of service (LOS) was calculated using Critical Movement Analysis. LOS is a qualitative measure of the effect of a number of operational factors including speed, travel delay, freedom to maneuver, and safety. The application of a level of service to an intersection essentially presents an index of its operational qualities. The Level of Service concept is identical to a grading system where grades (levels of service) range from A to F. In practice, any roadway may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. Level of Service "A" is the optimum condition of free flow where roadway operating conditions are at their best. Level of Service "C," a condition of stable flow, is generally considered desirable for peak or design flow in urban areas. Level of Service "E," on the other hand, represents an unstable flow condition where excessive congestion and delays are prevalent. It is characterized by backups or queues of vehicles waiting to pass through the intersection, and long delays are experienced. It is acceptable to design for Level of Service "D" conditions in heavily-traveled or congested urban areas.

The table below summarizes the LOS analysis. It indicates that difficulties will be experienced, particularly during the PM peak periods. The critical lane analysis technique shows only part of what will actually happen on the roadway network since the technique assumes optimal signal timing (which is not always the case). Further, other factors, including illegal parking and congestion unrelated to the immediate intersection, affect traffic flow. As a result, the operation of the intersections which were studied is described briefly in the following paragraphs.

INTERSECTION LEVEL OF SERVICE SUMMARY[1/]

Location		Existing Base LOS[2/]	Existing Base V/C[3/]	1987 No-Build Alternative LOS	1987 No-Build Alternative V/C	1987 Build Alternative LOS	1987 Build Alternative V/C
Northern Avenue at Atlantic Avenue	AM	B	0.58	C/D	0.77	D	0.84
	PM	C/D	0.77	E	0.98	E	1.01
Surface Artery at High Street	AM	D	0.83	D	0.85	D	0.86
	PM	C/D	0.78	D	0.81	D	0.81
Atlantic Avenue at India Street	AM	A	0.47	A	0.49	A	0.53
	PM	B	0.64	C	0.70	D	0.84

1/ The results assume efficient signal timing and that the future roadway improvements are operational by 1987.
2/ LOS = level of service.
3/ V/C = volume/capacity ratio.

Northern Avenue/Atlantic Avenue

Congestion at the Northern Avenue/Atlantic Avenue intersection is a result of two heavy converging streams of traffic passing through this intersection. While a stop sign is posted on the Northern Avenue approach, this control is ineffective during peak-afternoon traffic operations. A further complicating factor is the location of an on-ramp to the Central Artery directly opposite Northern Avenue. The heavy volume and lack of control result in a chaotic and unsafe situation at times, particularly during the PM peak. Queue buildup, particularly on Northern Avenue is also prevalent.

The analysis summarized in the above table indicates LOS "F" conditions are anticipated at the Northern Avenue/Atlantic Avenue intersection during the PM peak under both 1987 No-Build and Build conditions. Signalization of this intersection including the expressway approach is assumed after the Northern Avenue Bridge is relocated. The V/C ratios are slightly lower than those reported in previous analyses; however, since the base volumes used

in this analysis differed slightly from previous conditions, the essential results of the analysis are the same. The Building 114 EIR (EOEA #4427) indicated a PM peak V/C of 1.06, under what would be the 1987 No-Build Scenario while this analysis (which uses slightly different Third Harbor Tunnel numbers as a base) reveals a V/C of 0.98 for the same condition. The Northern Avenue/ Atlantic Avenue intersection will function at considerably lower levels of service than today, even with the Northern Avenue bridge replacement since no real gains in capacity are realized. The result will be long queues, particularly on Northern Avenue. The major reason for the degradation of operations at this location is the large increases in traffic due to the projected growth in South Boston. The impact of the Rowes Wharf project on the intersection will be relatively small and will amount to an estimated 126 PM peak-hour vehicle increment (revised to 114 PM peak-hour trips in the Final EIR).

Atlantic Avenue/East India Row/India Street

The critical movement evaluation of this intersection did not reveal any major capacity difficulties. This is not to say, however, that there are no problems. In fact, a fairly common occurrence on Atlantic Avenue northbound is the creation of relatively long queues of vehicles reaching back to the site. Causes of this situation are generally related to upstream difficulties, particularly illegal double parking and intersection congestion. The problem is most apparent on Friday evenings when travel demand for Logan Airport and the existing harbor tunnels is greatest. Many drivers choose to use the surface roadway system, particularly Atlantic Avenue to bypass the congested Central Artery. This occasionally results in extreme congestion conditions back along Atlantic Avenue, sometimes reaching to Congress Street.

High Street/Surface Artery/Atlantic Avenue

This intersection features a three-phase operation with a lead for northbound left turns, and a split phase which allows left turns on Atlantic Avenue to High Street on a partial overlap phase with northbound through vehicles.

Occasional difficulties are encountered at this intersection during the morning peak period, primarily due to the volume of left turns on the northbound approach (ramp from Central Artery). In addition, there is a considerable U turning volume which sometimes results in vehicle queuing on the approach's left lane. During the PM peak, a similar situation occurs on the Atlantic Avenue approach. The left lane on Atlantic Avenue experiences queue buildup due to insufficient green time at the signal to process this particular demand. In addition, traffic on the southbound side of the Surface Artery is typically sluggish due to the close intersection spacing, high traffic volumes, and legal and illegal parking on the roadway north of the site. It is expected that the impact of this project on the two more difficult movements will be minimal since neither will experience increases due to the development.

While not specifically studied, a major contributor to the sometimes difficult traffic operations in the area is the Central Artery. During heavily-traveled periods, many drivers choose to bypass the Artery by using the surface street system. The result is a highly-variable situation, with surface volumes along the surface streets heavy on some days and relatively low on others.

Parking Analysis

There are approximately 11,000 off-street parking spaces within the vicinity of Rowes Wharf. This area is bounded to the east by B Street in South Boston, to the south by Summer Street, to the west as far as Chauncy Street, and to the north by State Street and Atlantic Avenue near Waterfront Park. Generally, it incorporates the central business district and the popular parking areas in South Boston.

Of these 11,000 spaces, identified in the recent parking study for the Boston Traffic and Parking Department, 80 percent are public spaces. Observations of parking accumulation in the previous study were made at 10:00 AM and 12:00 noon, and maximum accumulation observed during the latter period showed an overall 90 percent parking-space occupancy. This indicates a very high demand for parking spaces in the area, particularly when it is noted that many of the spaces are more than a half mile from the middle of the central business district.

These findings are consistent with those relating to the full downtown study area which indicated an 88 percent public off-street parking space usage at 10:00 AM and a 94 percent usage at 12:00 noon.

Proposed Parking

Rowes Wharf development proposal includes 575 parking spaces which would be used for reserved (350 spaces) and commercial (225 spaces) purposes. Of the 350 reserved spaces, 170 are proposed for the 165 residential condominium units, representing slightly more than one space for each unit. The remaining 180 private spaces would be reserved for office and hotel use. It is expected that approximately half of these would be occupied by office vehicles entering during the morning peak hour and the remainder are expected to provide both reserved spaces and some turnover, accounting for additional vehicle trips. At night, the reserved office spaces could be made available for hotel and residential use. The evening demands created by the restaurant, marine uses, hotel, and surrounding public attractions would be accommodated by the 225-space public supply.

Future Parking Condition

Based on the significant amount of new development that is expected to be under construction by 1987, the demand for parking would greatly outnumber the supply. Included due to construction of other projects is the elimination of 650 spaces at International Place, 400 spaces at Kilby Street, 950 spaces at Post Office Square, and nearly 2,000 spaces at Piers 1, 2, and 3. Under such conditions, it is expected that the 225-space commercial parking supply proposed as part of the Rowes Wharf development would greatly help to serve the demand for parking which in 1987 cannot be accommodated. A reduction of up to 4,000 public parking spaces would mean that the remaining area supply would probably be utilized to capacity. Because of the significant projected deficits in parking supply, it is likely that downtown workers will experience a greater mode shift to transit.

Project Construction

During construction truck traffic will be entering and exiting the Rowes Wharf site via Atlantic Avenue, which provides the only roadway access. Truck traffic will occur during the excavation/construction of the underground garage and during the erection of the buildings at the following estimated volumes per day:

Activity	Trucks per day	Duration
Site demolition	3	2 mos.
Garage excavation and construction	60	9 mos.
Building construction	30	24 mos.

The effect of this additional traffic on the overall daily volumes on Atlantic Avenue (16,000 to 17,500 on an average weekday) will be minimal.

The construction of the foundation of the subsurface garage necessitates that a portion of Atlantic Avenue be utilized for staging. As a result existing on-street parking at the location will be eliminated during contruction.

The proponent has prepared a detailed phased traffic control plan that will maintain vehicular and pedestrian capacities throughout construction. These plans have been reviewed by City officials from the Traffic and Parking Department and have received concept approval.

Under the plan, Atlantic Avenue will maintain three lanes of travel at the south end of the site, which is the same number as presently available and is possible because the parking lane will be eliminated. At the north end of the site, two travel lanes will be maintained consistent with existing capacity. In addition the plan requires the proponent to restripe Atlantic Avenue and provide temporary jersey barriers, protected pedestrian cross-walks and sidewalks, and police traffic control details as appropriate.

At the start of construction, pedestrians will be rerouted to the west side of Atlantic Avenue. Two new crosswalks will be created on Atlantic Avenue at either end of the site and police officer control will be provided as appropriate. Two other crosswalks will be added at the intersection with High Street to allow pedestrians to cross traffic with the existing signal crossing pattern. A jersey barrier will be located along the west side of Atlantic Avenue, adjacent to the High Street on-ramp abutment to further improve pedestrian safety.

MITIGATION MEASURES

The third phase of the traffic study was the identification of mitigation measures necessary to minimize the traffic and parking impact of the project. The analysis of traffic impacts indicated that the proposed Rowes Wharf project will generate approximately 2,780 daily vehicle trips. While this impact is relatively small when compared to existing daily traffic and other projected background traffic, several mitigating measures were investigated to help reduce the project's traffic impact. Where mitigation measures require action by public agencies, the proponent is committed to working cooperatively to accomplish the measures briefly described on the following pages.

- Elimination of parking along the site frontage on Atlantic Avenue would provide space for taxi parking and hotel drop-off. This would reduce the safety hazard inherent with parallel parking on this heavily-traveled street.

- A signalized pedestrian crossing from the east side of Atlantic Avenue to the existing island in front of the proposed site will meet an obvious existing need. Pedestrian and vehicular volumes are uncontrolled at this location and result in a generally unsafe condition. This would complete the series of pedestrian crossings providing walking access from Atlantic Avenue to High Street. The proponent is committed to the improvement of this crossing area and will work with the City towards the installation of the recommended signalized pedestrian crossing. It is suggested that the pedestrian crossing of

Atlantic Avenue be installed on the south side of the proposed drive to provide gaps for project exiting traffic during peak periods without unduly interrupting through flows.

- Transit service to the site would be augmented by the docking provisions for ferryboats. Improved accommodation of these craft represents an opportunity to increase the attractiveness of this service, particularly for South Shore commuters.

- Advantage will be taken of the carpool/vanpool opportunities for work commuting trips to the site. Caravan, the state's ridesharing agency, which matches interested riders with existing vanpools and helps to initiate in-house programs, will be consulted. It is proposed that within the garage facility, clearly-designated spaces will be reserved if there are ridesharing vehicles to encourage increased participation and thus reduce vehicle trips.

- Subsidizing MBTA passes and a vanpool program, as well as providing visible transit information, can be most effective in increasing such ridership. These options are under consideration by the proponent.

- Atlantic Avenue north of the site is often congested during the evening due to parking on both sides of Atlantic Avenue north and south of East India Row. While additional travel lanes might not be practical, given the two-lane Atlantic Avenue constraint beyond the Marriott Hotel, a peak-hour parking ban would reduce the parking maneuver friction through this area and eliminate some of the sluggishness in peak period flow. The proponent will work with the City Traffic and Parking Department to implement this plan.

- As demonstrated elsewhere in the City, private security or management personnel routinely monitor the traffic flow in front of a private drive and at this project will also monitor and control on-site traffic.

- Construction techniques and approaches, including work when possible from the waterside, will help reduce the volume of construction-related traffic on Atlantic Avenue. See Chapter IV: Construction.

- A construction-phase traffic control plan, accommodating vehicular and pedestrian capacities, has been developed for the construction activities that require extending into Atlantic Avenue.

Air Quality

INTRODUCTION

The objective of the air quality analysis is to determine if the proposed Rowes Wharf development will interfere with the attainment or maintenance of Massachusetts and National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO). The standards, established by the Federal Clean Air Act, are designed to protect public health and welfare. To demonstrate compliance, it is necessary to identify those areas of human activity (sensitive receptors) exposed to maximum air pollutant levels from motor vehicle emissions in the project areas. Using air quality modeling techniques, CO levels are estimated at these sensitive receptors for the Build and No-Build Alternatives for the present and horizon years. Comparison of projected pollutant levels to the NAAQS permits evaluation of whether motor vehicle emissions related to the proposed development will pose a threat to public health or welfare.

The Draft EIR analyzed a maximum case of 700 parking spaces on the project site and found no significant environmental impacts. Subsequent to the Draft, a final parking program of 575 spaces was established as a result of discussions with the Air Pollution Control Commission and the Boston Redevelopment Authority (BRA). In conversations with the MEPA staff, it was determined that because the environmental assessment for the maximum case indicated no significant impacts on the roadways, the original traffic flow analysis for 700 spaces would adequately address the reduced parking program and would be retained (also see Chapter IV: Traffic and Parking). Following this decision, the original air quality analysis prepared for the maximum case parking program was also retained.

DESCRIPTION OF THE ENVIRONMENT

Pollutant Sources and Effects

The most significant source of project-related air pollution is from motor vehicles visiting the project site. Of the six pollutants regulated by the NAAQS, four are emitted by motor vehicles or formed from their emissions: carbon monoxide (CO), nitrogen oxides (NO_X), ozone (O_3), and lead (Pb). Carbon monoxide is used in this analysis as an indicator of roadway air pollution levels since it is the most abundant and persistent pollutant emitted by motor vehicles. Further, its nonreactive properties allow pollutant transport and dispersion to be modeled.

The adverse health effects of carbon monoxide are a result of its combination with blood hemoglobin to form carboxyhemoglobin (COHb). This compound interferes with the life-sustaining transfer of oxygen from the lungs to the body tissues, and the return of carbon dioxide from the tissues to the lungs. The presence of relatively small amounts of CO results in significant interference with essential cardiovascular-respiratory functions. Relatively brief exposure to high levels can impair time-interval discrimination, visual acuity, and other psychomotor functions.

NAAQS for carbon monoxide have been set by the U.S. Environmental Protection Agency (EPA) and are presented in Figure IV-9. Standards for the Commonwealth of Massachusetts are identical to federal standards. The primary standards are intended to protect the public health, while secondary standards are designed to protect the public welfare from any known or anticipated effects.

The target date for attainment of national primary and secondary standards was December 31, 1982. If states, such as Massachusetts, did not attain the carbon monoxide and ozone standards by this date through the use of all reasonably available control measures, an attainment date of December 31, 1987 applies. Identical for primary and secondary, the CO standards set a maximum concentration of 35 parts per million (ppm) for a 1-hour period and 9 ppm for 8 hours, each not to be exceeded more than once per year.

Ambient Air Quality

Ambient air quality is usually determined by monitoring; however, no state monitoring station exists proximate to the site. Background levels of CO for 1984 in the study area have been determined by the Massachusetts Department of Environmental Quality Engineering (DEQE) to be 5.0 ppm (1-hour average) and 3.0 ppm (8-hour average)1/. Background levels for this project represent CO emissions from all sources except the roadways that cross at the intersections analyzed.

1/ Personal communication, Ms. Heidi O'Brien, Division of Air Quality Control, DEQE, Boston, MA, March 1, 1984.

Figure IV-9

Massachusetts and National Ambient Air Quality Standards (NAAQS) for Carbon Monoxide (CO)

Averaging Time[1]	Primary[2] Standards	Secondary[3] Standards
8 hours	9 ppm (10 mg/m^3)	Same as Primary
1 hour	35 ppm (40mg/m^3)	

1/ Not to be exceeded more than once per year.

2/ National Primary Standards--the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

3/ National Secondary Standards--the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Methodology For Estimating Air Quality

The technical approach used to predict ambient air quality was approved in advance by DEQE.[1] The analysis calculated maximum 1-hour and 8-hour CO concentrations, at sensitive receptors near three intersections studied in the traffic analysis, for the following three cases:

Case No.	Year	Development Alternative
1	1984	Existing
2	1987	No-Build
3	1987	Build

The three intersections studied are:

- Atlantic Avenue and Northern Avenue--Receptor 1.
- Atlantic Avenue and East India Street--Receptor 2.
- Surface Artery, High Street, and Atlantic Avenue--Receptor 3.

In all cases, the EPA Indirect Source Guideline model[2] was used to predict concentrations, supplemented by a set of assumptions specified by DEQE. Details are provided in Appendix 3.

A separate analysis of the impact of the proposed underground-garage ventilation system was conducted for the 1987 development alternative. Maximum 1-hour and 8-hour CO concentrations were predicted using a dilution calculation and Halitsley's model for near-field receptors.[3]

Figure IV-10 indicates the location of the roadway intersection receptors as well as sensitive parking garage receptors.

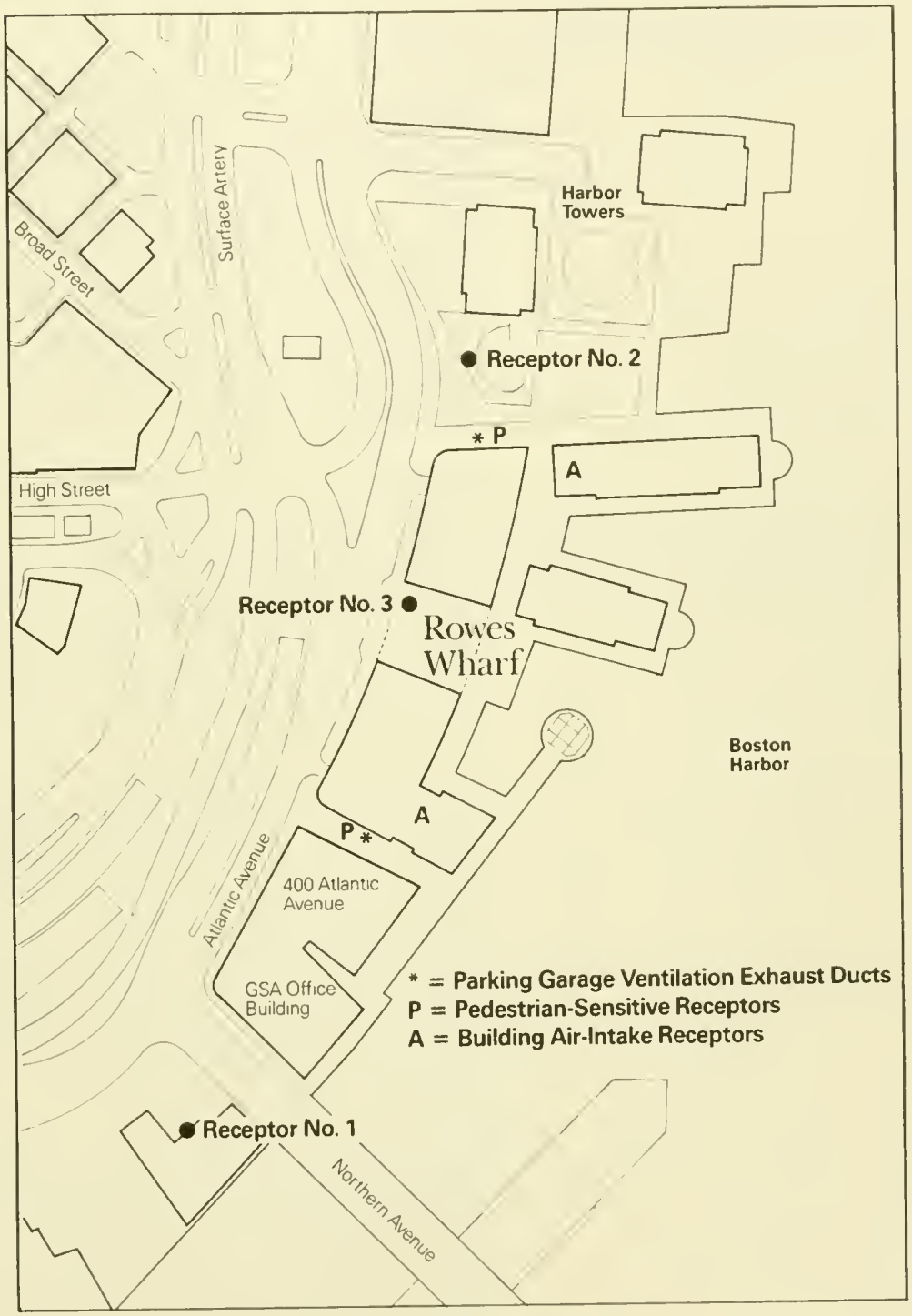
1/ Personal communication, Ms. Heidi O'Brien, Division of Air Quality Control, DEQE, Boston, MA, March 1 and 7, 1984.

2/ EPA, Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9 (Revised); Evaluating Indirect Sources, Second Printing, EPA-450/4-78-001, Research Triangle Park, NC, September 1978.

3/ Halitsley, J., "Gas Diffusion Near Buildings," Meteorology and Atomic Energy 1968, U.S. Department of Energy (NTIS TID-24190), 1968, pp. 246-252.

Figure IV-10

Receptor Locations for the Air Quality Analysis



PROBABLE PROJECT IMPACTS

Intersection Analysis

The air quality analysis predicted maximum 1-hour and 8-hour CO concentrations at sensitive receptors using the EPA Indirect Source Guideline technique. Worksheets from the roadway analysis are included in Appendix 3. The cumulative results of the air quality analysis, including impacts from intersection traffic and background carbon monoxide, are presented in Figure IV-11. These results do not characterize typical air pollution levels in the project area. Rather, they represent the highest concentrations that could exist during the joint occurrence of worst-case meteorology and peak traffic.

Modeling results for both the existing (1984) and future design year (1987) show no violation of the 1-hour and 8-hour CO standards. The highest predicted 1-hour CO concentration is 25.6 ppm for the existing case at the Surface Artery, High Street, and Atlantic Avenue intersection (Receptor 3), and for the 1987 Build case at Atlantic Avenue/Northern Avenue (Receptor 1). The highest predicted 8-hour CO concentration is 5.6 ppm, for the existing case at Receptor 3.

Significant reductions in CO concentrations will occur by 1987 except at Receptor 1, where CO levels will increase due to changes in traffic control. The reconstruction of this intersection and the Northern Avenue bridge, a project independent of Rowes Wharf, will involve the installation of a signal where only a stop sign now exists. Since signals process traffic less efficiently during peak periods, longer queues and delays will occur in 1987 than now exist. Reductions by 1987 at the other two intersections are attributable to the State Inspection and Maintenance Program (I&M) and the continuing trend toward cleaner vehicles.

The results in Figure IV-11 demonstrate that the proposed Rowes Wharf development will not interfere with the attainment and maintenance of the NAAQS for CO. The development will increase CO concentrations, however, over those predicted for the No-Build case in 1987. The increase is greatest at the intersection of East India Street/Atlantic Avenue (Receptor 2).

Figure IV-11

Predicted Maximum CO Concentrations at Three Project Area Intersections, Plus Background PPM*

Receptor	1984 Existing (Case 1)		1987 No-Build (Case 2)		1987 Build (Case 3)	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
Atlantic Avenue/ Northern Avenue (Receptor 1)	14.0 ppm	4.2 ppm	24.4 ppm	4.4 ppm	25.6 ppm	4.6 ppm
Atlantic Avenue/ East India (Receptor 2)	19.7	5.0	14.6	3.7	17.7	4.0
Surface Artery/ High Street/ Atlantic Avenue (Receptor 3)	25.6	5.6	17.9	4.0	18.3	4.2

* The CO standards set a maximum concentration of 35 parts per million (ppm) for a 1-hour period and 9 ppm for 8 hours, each not to be exceeded more than once per year.

The modeling results reported in Figure IV-11 can be compared to those from the Commonwealth Pier Five Final EIR at a common point, namely Receptor 1 at the intersection of Northern Avenue/Atlantic Avenue. The 1987 BOSCOM Build case in that earlier EIR is close in development assumptions to the 1987 No-Build case used here. Predicted CO concentrations are compared in Figure IV-12. The maximum 1-hour concentrations for Receptor 1 are nearly identical, and the difference in the maximum 8-hour concentrations is due principally to differences in the worst case 8-hour wind speeds assumed for each EIR. Even with these differences, both analyses show compliance with the NAAQS in 1987 at this intersection if the I&M Program is enforced. In the Commonwealth Pier Five EIR, I&M was a mitigation measure, whereas in this EIR it is a given assumption since the Program has been implemented.

The Third Harbor Tunnel EIR can also be compared to the modeling results shown here. Receptor 3 between Rowes and Fosters Wharves is close to Receptor No. 34 used in the Third Harbor Tunnel EIR. Beyond this point, however, the similarities end. The future years, modeling techniques, and assumptions are different. For example, the I&M program was not assumed in the Third Harbor Tunnel EIR results and the future year of analysis was 1990. With all of these differences, the predicted maximum CO concentrations, also shown in Figure IV-12, are still relatively close.

Parking Garage Analysis

The analysis of the impacts of parking-garage ventilation air predicted maximum 1-hour and 8-hour CO concentrations for the 1987 No-Build case at three sensitive receptors using Halitsley's gas diffusion equations (see Figure IV-13). Background concentrations were accounted for in the dilution calculations. The current design for garage ventilation calls for two vents, 15-feet high on the building facades near the north and south site boundaries. Impacts were predicted for a pedestrian receptor near the ventilation stacks, the closest building air-intake duct for residential/office space on the site, and the closest intersection receptor (Receptor 2). The impact at Receptor 2 was used as a conservative estimate of the impacts at Receptors 1 and 3 which are farther from the ventilation stacks.

Figure IV-12

Comparison of Predicted CO Concentrations (PPM) as Reported in Two Separate EIRs

	Peak 1-Hour	Peak 8-Hour
NORTHERN AVENUE/ATLANTIC AVENUE (RECEPTOR 1)		
Rowes Wharf (EIR)[1] 1987 No-Build Case with I&M Program	24.4 ppm	4.4 ppm
Commonwealth Pier Five EIR[2] 1987 BOSCOM Build Case with I&M Program	23.3	7.7
SURFACE ARTERY/HIGH STREET/ ATLANTIC AVENUE (RECEPTOR 3)		
Rowes Wharf EIR [3] 1987 No-Build Case with I&M Program	17.9	4.0
Third Harbor Tunnel EIR[4] 1990 Alternative 1 (No Third Harbor Tunnel or Depressed Artery with no I&M Program). Results shown are for Receptor No. 34.	13.0	6.0

1/ See Figure IV-11.

2/ Supplement to the Commonwealth Pier Five Redevelopment Final EIR, prepared by Skidmore, Owings & Merrill, Boston, MA, October 20, 1982.

3/ See Figure IV-11.

4/ Supplement to the DEIR, Third Harbor Tunnel, Interstate 90/Central Artery, Interstate 93, FHWA-MA-EIS-82-02-DS, June 1983, pp. 210-212.

Figure IV-13

Predicted Maximum CO Concentrations at Three Receptors Impacted by the Parking Garage Ventilation System for the 1987 Build Case (PPM)

Receptor Location	Peak 1-Hour	Peak 8-Hour
Pedestrian Area Near Exhaust Vents	5.0 ppm	0.9 ppm
Nearest Building Air-Intake Duct	5.5	1.0
Intersection Receptor No. 2 1/	3.0	0.5

1/ As noted in the text, predicted CO concentrations from garage ventilation at Receptor 2 can be used as a conservative assumption of additional CO at each of the roadway intersection receptors. If garage-related concentrations are added to traffic-related concentrations, there are still no violations of the NAAQS. The results are concentrations as follows:

1987 BUILD, MAXIMUM CO CONCENTRATIONS (PPM)

	1-Hour			8-Hour		
	Traffic	+ Garage	= Total	Traffic	+ Garage	= Total
Atlantic Avenue/ Northern Avenue (Receptor 1)	25.6	3.0	28.6	4.6	0.5	5.1
Atlantic Avenue/ East India (Receptor 2)	17.7	3.0	20.7	4.0	0.5	4.5
Surface Artery/ Atlantic Avenue/ High Street (Receptor 3)	18.3	3.0	21.3	4.2	0.5	4.7

The results show maximum concentrations will be below the NAAQS at all receptor sites. The greatest impact from the parking-garage vents occurs at the air-intake ducts for nearby buildings, where CO concentrations are 5.5 ppm for the peak 1-hour period and are 1.0 ppm for the peak 8-hour period. The increases in CO concentrations at the intersection receptors do not change the conclusions regarding compliance with the NAAQS stated in the previous subsection.

Stationary Sources

The only stationary sources of air pollutants planned for the development site are natural-gas boilers to meet space-heating and/or domestic hot water requirements. The exact number, size, and location of the boilers have not yet been determined. Under Massachusetts Air Pollution Control Regulations (310 CMR 7.02, 7.04), a permit is required from DEQE before construction can begin on any fossil-fuel utilization facility having an energy input greater than 3 million Btu's per hour. A permit application for each such facility will be prepared and submitted to DEQE including all necessary plans, specifications, a standard operating procedure, a proposed maintenance procedure, and certification that the facility will comply with applicable emission limits for particulates and nitrogen oxides.

Parking Freeze Permit

An application has been filed with the Boston Air Pollution Control Commission and a public hearing held to review the Parking Freeze Permit for the proposed underground garage. This matter is discussed further in the section on Traffic and Parking in Chapter IV.

MITIGATION MEASURES

While the project's addition to CO levels does not cause them to exceed air quality standards, measures can be taken to mitigate the increases in concentration predicted for 1987. These increases are greatest at the intersection of East India Street/Atlantic Avenue (Receptor 2), representing a 21 percent rise in peak 1-hour CO levels and an 8 percent rise in peak 8-hour CO levels. At the other two intersections, the increases are all less than 5 percent.

The air quality analysis assumed the continuation through 1987 of parking along both sides of Atlantic Avenue at the intersection with East India Street. A possible mitigation measure is to eliminate this parking during the afternoon peak period (4 to 6 pm). The effect of this measure would be to increase the capacity of Atlantic Avenue at this intersection, reduce queue lengths and delays, and decrease CO concentrations for the peak hour. With this mitigation measure, the predicted 1-hour 1987 Build concentration at Receptor 2 is 15.5 ppm, compared to 17.7 ppm without the mitigation measure. The 1987 No-Build concentration (without mitigation) is 14.6 ppm.

The Commonwealth's I&M program started on April 1, 1983 and has been assumed in the calculation of 1987 motor vehicle emission rates. The conclusion that future air quality levels will not violate the NAAQS for CO is dependent on the continued enforcement of this program. Any other traffic-related mitigation measure to reduce vehicle conflicts and delays will similarly improve future air quality. Traffic-related mitigation measures are discussed elsewhere in this EIR.

A short-term impact on air quality could arise as a result of fugitive dust emissions during project construction. Wetting is the most effective control method for this activity. As a mitigation measure, areas subject to wind erosion will be watered during construction to prevent excessive emissions. Notification will be given 20 days prior to the start of construction as required under Massachusetts Air Pollution Control Regulations (310 CMR 7.09, subsection 2).

Visual Quality and Urban Design

INTRODUCTION

This Section describes the effects of the Rowes Wharf project on the visual and urban design qualities of the surrounding built environment. The following pages initially focus on the extensive planning and design review process, part of an overall Boston Harbor planning effort, which has guided project design. The conformance between the project's urban design components and specific guidelines established for the site by the Boston Redevelopment Authority (BRA) and the Boston Society of Architects (BSA) is then analyzed. The final portion of this Section discusses the project's physical context and its potential impact on the visual quality of the surrounding area.

PLANNING AND URBAN DESIGN CONTEXT

Boston Harbor Plan/ Urban Renewal Plan

The Rowes Wharf project is a key element in the Boston Harbor Plan, which was commissioned and adopted by the BRA in 1979. This Plan serves as a refinement to the earlier Urban Renewal Plan for the waterfront which established general goals for the area. Prepared by Sasaki Associates, the Boston Harbor Plan was viewed as a first step in formulating detailed planning and design goals for Boston's waterfront.

The Harbor planning process has involved diverse public and private groups interested in the future of the waterfront. A series of public workshops, involving 40 to 100 people over a two-year period, culminated in the public presentation of the Plan in October 1979. The 50-page final report recommended numerous broad goals for Boston Harbor including the following:

- Assure adequate public access and open space along the waterfront.
- Better accommodate boating uses and provide an orderly program for their growth and expansion.
- Create opportunities for sound high-density development, compatible with other waterfront uses. Mixed-use structures (office, residential, retail) are encouraged along Atlantic Avenue.
- Improve linkages between the MBTA and commuter/ tourist/excursion boats.
- Preserve and enhance environmental and navigational conditions in the Harbor.

- Assure that contemporary design and new public spaces reflect the waterfront's historic past.

- Propose a public strategy for dealing with Harbor issues.

The Boston Harbor Plan's specific guidelines for Rowes Wharf recommended high-intensity, active development including mixed-use opportunities such as mid-rise residential structures, water-dependent uses, structured parking, public walkways and open space, and a water transportation terminal. Additional recommendations for Rowes Wharf can be summarized as follows:

- Provide a visual terminus for the Broad Street linkage to the sea, with open space adjacent to the former location of the historic ferry slip, and orient the development to provide views from Atlantic Avenue to the Harbor.

- Provide finger paths to and public access along the water's edge and the reconstructed piers.

- Develop a mini-park between India and Rowes Wharves to continue the open space system forming the Harbor walk.

- Allocate a portion of the ground level to water-dependent uses such as a small, private pleasure-boat basin associated with the mini-park noted above.

- Provide a covered and outdoor waiting space, connected to the boats' berthing area.

- Incorporate structured parking and a rooftop restaurant/overlook above the boat passenger facilities. Design the passenger waiting area to permit views from Atlantic Avenue to the Harbor through the structure.

The 1979 Boston Harbor Plan includes illustrations of a potential development concept for Rowes Wharf in accordance with the above recommendations. As depicted in the Plan, predominately residential mixed-use towers, of approximately 20 stories, step down to six stories at the water's edge. Oriented in a finger-pier configuration, the towers are flanked on the south by a parking garage with a boat terminal and commercial uses

on the ground floor. Open space and an entrance drive are located between the two towers directly across from the intersection of High and Broad Streets.

BRA/BSA Guidelines

Following completion of the 1979 Plan, the BRA in conjunction with the BSA formulated specific land use and design guidelines for the site, refining the initial design concepts illustrated in the Boston Harbor Plan. The BRA/BSA guidelines for Rowes Wharf are the formal articulation of design controls for the project.

The design concept calls for an urban mixed-use project with a strong relationship to its context and a major allowance for public access and use. Views from within and outside the project as well as scale, modeling of forms, orientation, and massing are considered vital to the site's design concept.

In 1982, developers were invited by public advertisement to submit proposals for Rowes Wharf based on the issued guidelines. The Beacon Companies was selected in May 1983 on the basis of a design proposal that was responsive to and consistent with the BRA/BSA Guidelines. The relationship between the proposed project and the design guidelines is highlighted on the following pages.

Subsequent to designation, a design review process was initiated to monitor the development and refinement of the proposal. The design review team is composed of members of the BRA staff and a special four-member review group appointed by the BSA. This review team has been meeting every few weeks throughout the design process and has reviewed in-process design materials relating to massing, organization and interrelationship of uses, floor plans, ground floor uses and layout, facade materials and articulation, and window treatment.

In addition to the review team, other groups have been contacted and meetings held in which their comments have been elicited as the design work proceeds. These include representatives of various state agencies, The Boston Harbor Associates, Boston Educational Marine Exchange, the Boston Preservation Alliance, Waterfront Residents Association, and others.

Relationship Between Proposed Rowes Wharf Project and BRA/BSA Guidelines

BRA/BSA Design Guidelines	Rowes Wharf Project
1. Uses	
a) Predominately residential and office with ground-floor space devoted to retail and restaurant uses.	a) Project follows guidelines. Ground floor uses include restaurant, retail, hotel lobby, residential and office lobbies, marina, and ferry terminal uses.
b) Preservation of the water's edge for pedestrian and water-related uses, including a boat terminal with indoor ticketing and waiting areas.	b) Public pedestrian walkways are included around the entire project perimeter. A ferry terminal, including docking and indoor ticketing and waiting facilities, is also provided. A marina is provided at the water's edge along with a public dinghy dock.
c) Parking spaces primarily below grade with service areas to be fully enclosed and screened from view.	c) All parking and service areas are located below grade.
2. Massing and Building Height	
a) Gross FAR of 4 with a maximum building height of 165 feet and no more than 2-3 stories at the water's edge.	a) Project conforms with FAR. Building height of approximately 182 feet from mean grade to top of roof slab of last habitable floor. Maximum building height totals 16 stories. Wharf buildings step down to two stories at the eastern end of the pier. Change in maximum height from 165 feet to 182 feet due to change from concrete to steel structural system. See Notification of Project Changes, Appendix 6, for full description of project height and approvals.
b) Major massing elements must relate to one another and to the character of the local architecture.	b) The structures along Atlantic Avenue consist of two mirror-image buildings at either end of a central structure which incorporates an arched rotunda element. Atlantic Avenue masses, cornices, and fenestration reflect the lines, openings, and bulk of surrounding, older Boston buildings. The wharf build-

BRA/BSA Design Guidelines	Rowes Wharf Project
	ings reflect the form and proportion of existing Boston wharf structures. See following subsection for further discussion.
c) Public spaces, streets, and the water's edge must be clearly defined by the principal building masses, and major public plaza areas must be clearly accessible from grade.	c) Principal building masses follow the lines of Atlantic Avenue and the water's edge, creating a transition between the street and harbor geometries while reinforcing both the public street edge and the water's edge. A central court area is accentuated by an arched rotunda space. All public plaza areas are at grade or separated by only a few feet. All pedestrian areas are accessible to the handicapped.
d) Atlantic Avenue frontage should reinforce moderate building heights and should not suggest barriers between the waterfront and downtown areas.	d) Building massing along Atlantic Avenue generally reflects the height and massing of surrounding buildings. The Atlantic Avenue building is broken into three principal elements: two 16-story structures and the five-story arched rotunda. Upper-level setbacks serve to reduce the scale of the building and the skylit rotunda space creates a compelling gateway to the Harbor. Wide promenades at the northern and southern ends of the site open additional vistas to the Harbor.
3. Open Space	
a) A minimum of 50% of the site must be open space at the ground-floor level (below the fourth floor).	a) Approximately 2/3 of the site is dedicated to public open space. These interrelated areas invite open access on all sides, along the water, and through the center of the project.
b) The ground plane of the site should be highly programmed, heavily landscaped, and provide an exciting activity with a clear architectural expression as a public destination.	b) The ground plane of the site includes a variety of highly programmed public areas with special paving, landscaping, lighting, and trellis elements. Rowes Walk and the northern and southern promenades

BRA/BSA Design Guidelines	Rowes Wharf Project
	are flanked with restaurant and retail uses. A marina, restaurant, and ferry terminal dominate the piers. The central arched space provides a clear architectural expression as a public destination containing major lobby entrances, restaurants, and retail uses.
c) Public areas should be designed to maximize climatic benefits and provide protection from winter winds.	c) Public areas such as Rowes Walk, Fosters Court, the ferry terminal, and most on-site walkways are oriented for protection from prevailing southwest winter winds. Also see Chapter IV, Wind.
d) Public uses at the rooftop level are required (restaurant or observation deck).	d) A public lounge/observation area, in conjunction with a health club, is located within the glass rotunda area on the 8th floor. The south wharf building will also house a restaurant.
e) A transparent enclosure of a significant public space should be considered.	e) The ground floor maximizes at-grade public areas open to the air. In addition, the ferry terminal provides a transparent enclosure as a major focal point for the site.
4. Public Pedestrian Access and Vistas through the Site	
a) All major public areas shall be for pedestrian use only.	a) Two-thirds of the site is devoted to open space and water, and is completely accessible to the public through walkways and plazas.
b) Provide as much visual access to the Harbor as possible from Atlantic Avenue and the Central Artery. Specific vistas (at least 4 stories in height) shall include: --A 30-foot wide easement at 400 Atlantic Avenue. --A 50-foot wide opening aligning with and providing view of the Harbor from Broad Street. --A 30-foot wide easement along the northern edge of the parcel.	b) The northern and southern promenades are 30-feet in width. The central arched space, 72-feet wide and five stories high, provides a view of the Harbor from Broad Street that increases gradually as the viewer progresses down Broad Street toward the waterfront. At the corner of High and Broad Streets, the arched opening is fully apparent, providing a wide vista to the Harbor and ferry terminal.

BRA/BSA Design Guidelines	Rowes Wharf Project
c) A continuous water's edge pedestrian way linking the Harbor Towers walkway to 400 Atlantic Avenue.	c) Continuous pedestrian walkways are proposed through the site and along the water from Harbor Towers to the south wharf building where it joins the ferry terminal pier and the proposed harbor walk.
d) Continuation of the Boston waterfront "pier configuration."	d) The north and central wharf buildings continue the theme of the waterfront pier configuration while the south wharf building and ferry terminal form a transition to the bulkhead line of Fort Point Channel.
5. Materials	
a) Building exterior and site materials should respect the masonry character of the nearby downtown and will be subject to design review.	a) The brick and masonry detailing of the facade is being designed specifically to reflect the qualities of the surrounding older downtown buildings. Building exterior designs have been and will continue to be the subject of design review as described in the previous subsection, "BRA/BSA Guidelines".

Project Modifications Submitted Since the Draft EIR

The Rowes Wharf Development has undergone several design modifications since the submission of the Draft EIR in response to public comments and due to a change in the project's structural system. These changes are summarized below.

Height Change. Project design was modified to reflect a steel structural system rather than the concrete structural system originally specified. The reasons for this decision--which included an accelerated construction schedule, design, constructability, marketing, and cost--are specified in Appendix 6. While this system results in an additional 17 feet at the highest point of the structure to accommodate the steel system, the project is maintained at the original number of stories throughout, or 16 stories at its highest point, and no additional floor area is created.

Site Plan Modification. The project's configuration was altered in response to comments by the Secretary of Environmental Affairs and other parties. This modification includes:

- All project structures and maritime facilities have been relocated behind the State Harbor Line and U.S. Pierhead and Bulkhead Line of 1940.
- The public dinghy dock has been relocated to the inlet between the north and central piers.
- The marina is redesigned to provide individual slips.

A major goal of these changes was to improve navigational safety.

Widened Central Arch. The project's central arch on Atlantic Avenue has been widened from a 60-foot width to 72 feet. Enlarged in response to concerns about the view down Broad Street and the massing on Atlantic Avenue, it will provide a more prominent view of the Harbor.

Modifications to project height and the site plan configuration are detailed in the Notification of Project Changes submitted to the Secretary of Environmental Affairs on June 7, 1984 (see Appendix 6).

The height change and site plan modification have been reviewed by the BRA/BSA review team (see Attachments 1, 2, and 3 of Appendix 6), the public, and the Secretary of Environmental Affairs, and were found by the Secretary to not warrant rescoping. Chapter VI: Comments and Responses, presents the Secretary's and the public's response to these changes. The decision to enlarge the central arch emerged from an indepth exploration of design modifications by the Rowes Wharf project team in response to comments received on the Draft EIR. This and other design alternatives were reviewed with representatives of the Boston Preservation Alliance and Boston Landmarks Commission on July 3, 1984. The 12-foot increase in the arch width was incorporated in response to these groups' comments and recommendations and is believed to most fully address their visual concerns while not cutting off other important views to the water. The proponent will continue to meet with these groups to review the archway as well as other design elements of concern.

The views in this Section have been altered to reflect the design modifications and all the above changes.

PROBABLE PROJECT IMPACTS

The urban design context for the Rowes Wharf project must be drawn from a number of surrounding districts or development areas. The site is located at a unique transition point between the Fort Point Channel area, where building to the bulkhead line is characteristic, and the finger piers of the Boston Shawmut area. The project is also a transition point between the older Atlantic Avenue waterfront buildings and Harbor Towers. The GSA Appraiser's Building and 400 Atlantic Avenue, immediately south of the project, are characteristic of a number of older buildings in the Financial District and Fort Point Channel area. While once closely joined to the fabric of the downtown, these waterfront buildings are now severed from the downtown by the Central Artery. In addition, parking lots and new construction have led to an irregular building line along Atlantic Avenue.

The design for Rowes Wharf responds to each of these contextual influences. Building massing along Atlantic Avenue holds the line of the street, reinforcing its edge. The masses are stepped back at the eighth floor responding to the scale of neighboring buildings on Atlantic Avenue. The symmetrical massing reflects the composition of the majority of Boston's older downtown

buildings. Openings in the building's facade are scaled appropriately to surrounding buildings, and the brick and masonry palette is intended to reflect the surrounding context. Also, due to its proximity to the Financial District and because it will be the home for a ferry terminal, Rowes Wharf will become a major gateway to the Harbor from the downtown. Figure IV-14 illustrates the proposed development and provides a ground-floor plan.

The arch and rotunda element at the center of the project presents a powerful and compelling gateway to Boston Harbor. Seen from afar, the glass rotunda forms a beacon or signal of the gateway. Traveling down Broad Street, the archway opens gradually to the waterfront, drawing the pedestrian to the Harbor. With the potential depression of the Central Artery, the Rowes Wharf gateway-to-the-sea will be even more visible and significant.

Traveling through the arch, the project becomes a series of pier and wharf buildings stretching into the Harbor, reflecting themes established by the existing historic wharf structures along Boston's waterfront. The south wharf and ferry terminal form a creative transition between these piers and the seawall along Fort Point Channel.

Visual Analysis

The discussion and sketches that conclude this Section, identify the design impacts on the visual environment likely to result from the development of Rowes Wharf. These effects are described through a series of eye-level views of the project as seen from the downtown and the waterfront. Each view, comparing the existing condition (No-Build) with the current design proposal, is based on computer-generated, three-dimensional visual modeling from set distances along specific streets. An accurate representation of what would actually be experienced by the viewer is presented.

Figure IV-14

Proposed Development Project

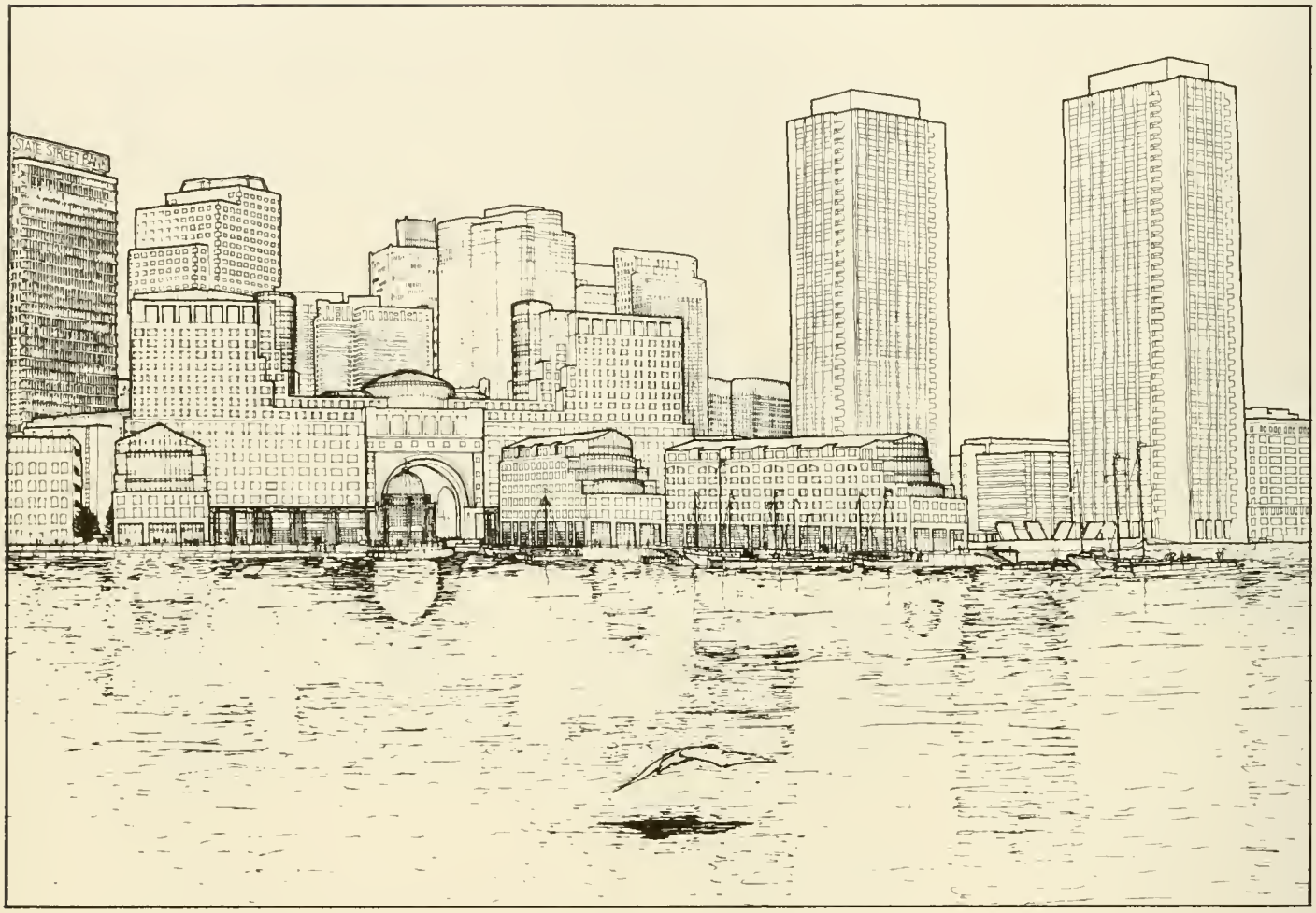
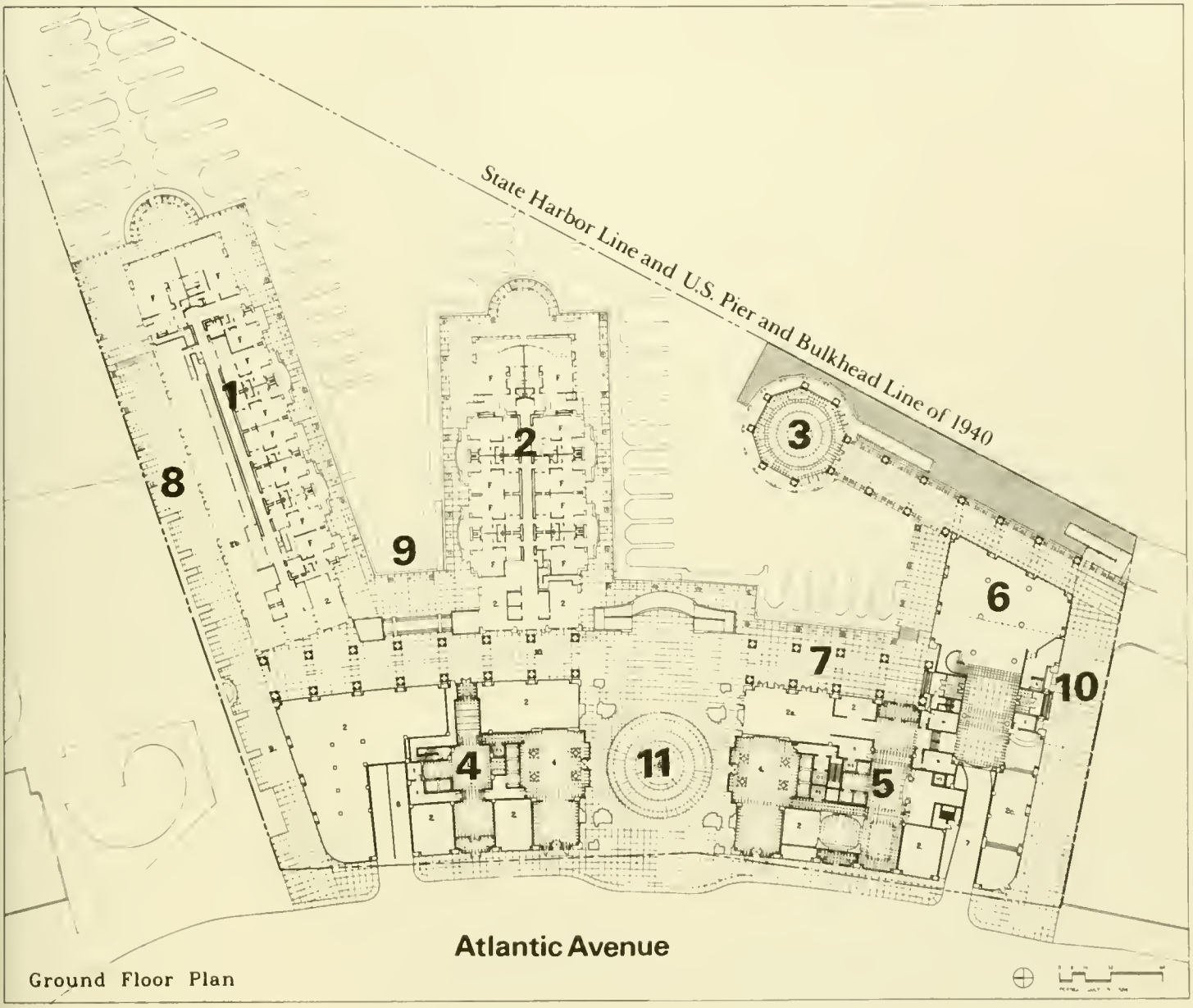


Figure IV-14 con't.

Proposed Development Project



1. Residential/Commercial (North Wharf)
2. Residential (Central Wharf)
3. Ferry Terminal/Boarding Area
4. Office/Residential
5. Office/Executive Suites
6. Restaurant/Office/Ferry Terminal
   Future Expansion Area (South Wharf)
7. Rowes Walk
8. Northern Promenade
9. Dinghy Dock
10. Southern Promenade
11. Central Arch/Public Observatory (above)

The design characteristics, used as criteria to evaluate the visual impact of the proposed project, include:

- o Height
- o Scale
- o Massing
- o Connections/Linkage
  - --Physical
  - --Visual
  - --Image
- o Architectural Character/Flavor
- o Materials
- o View Corridors
- o Public Accessibility
- o Pedestrian Movement/Activity

Six views were initially chosen as critical to this visual analysis. Two additional views down Broad Street have been analyzed in the Final EIR in response to comments received on the Draft EIR. Of the eight views presented, seven are taken at various points along pedestrian pathways. Figure IV-15 shows major pedestrian paths toward the project area. The other view (View A) is from Fan Pier and illustrates the potential impacts when experiencing the project from the water. The accompanying map (Figure IV-16) identifies the locations from which each view is taken.

Of fundamental importance to this analysis is the impact of the proposed project on pedestrian access to the site. Figures IV-17 and IV-18 compare existing on-site access to proposed on-site access. As the diagrams clearly illustrate, the proposed development will dramatically increase public accessibility to the waterfront. Currently, most of the site is being used for parking and pedestrians are cut off from the water's edge due to the unsafe condition of the existing wharf structures. Along with improved accessibility, the project would also create an important link in Boston's walk-by-the-sea, connecting Harbor Towers on the north to 400 Atlantic Avenue on the south with a continuous pathway along the water.

Figure IV-15

Major Pedestrian Paths to Site

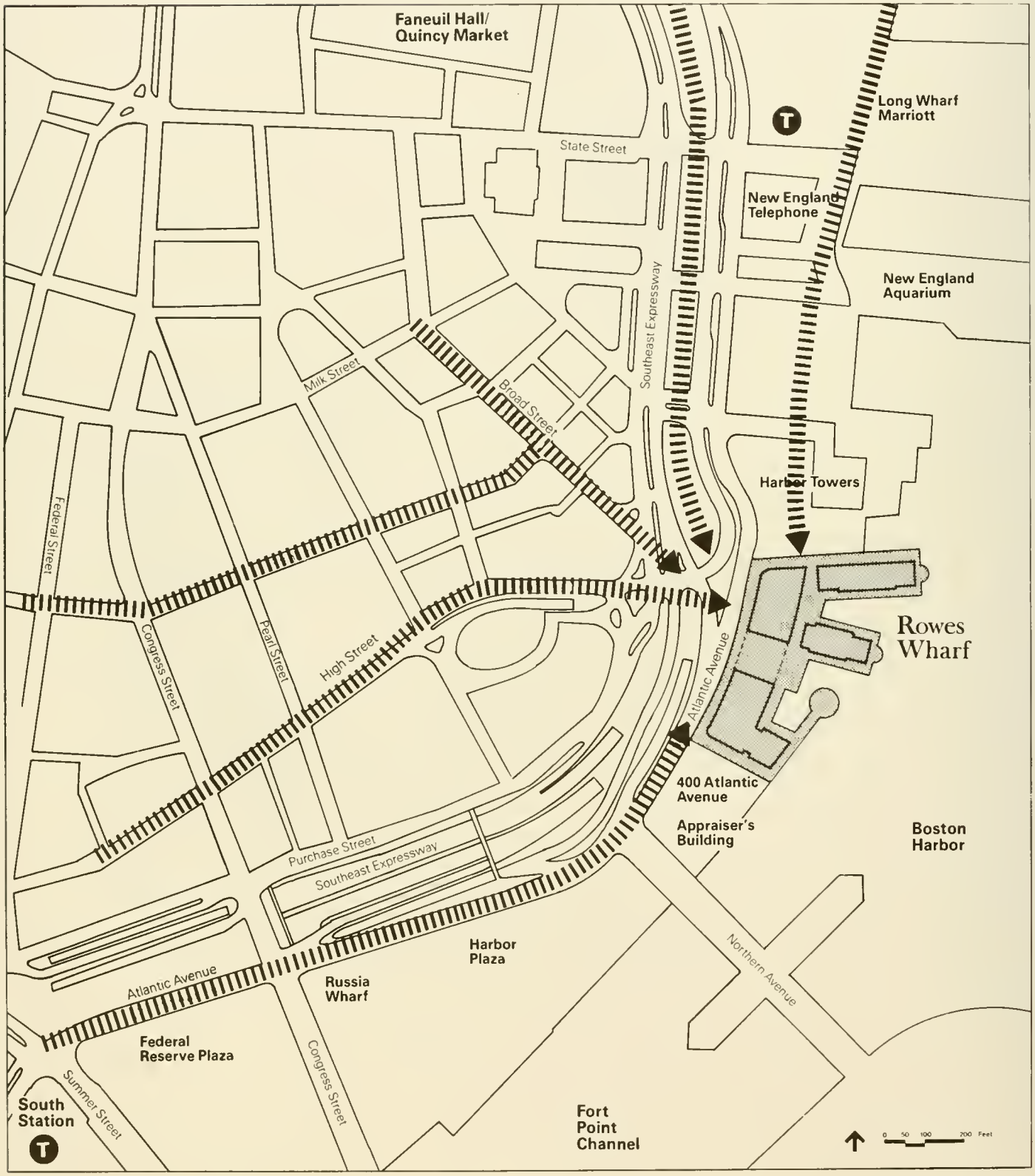


Figure IV-16

Views Analyzed

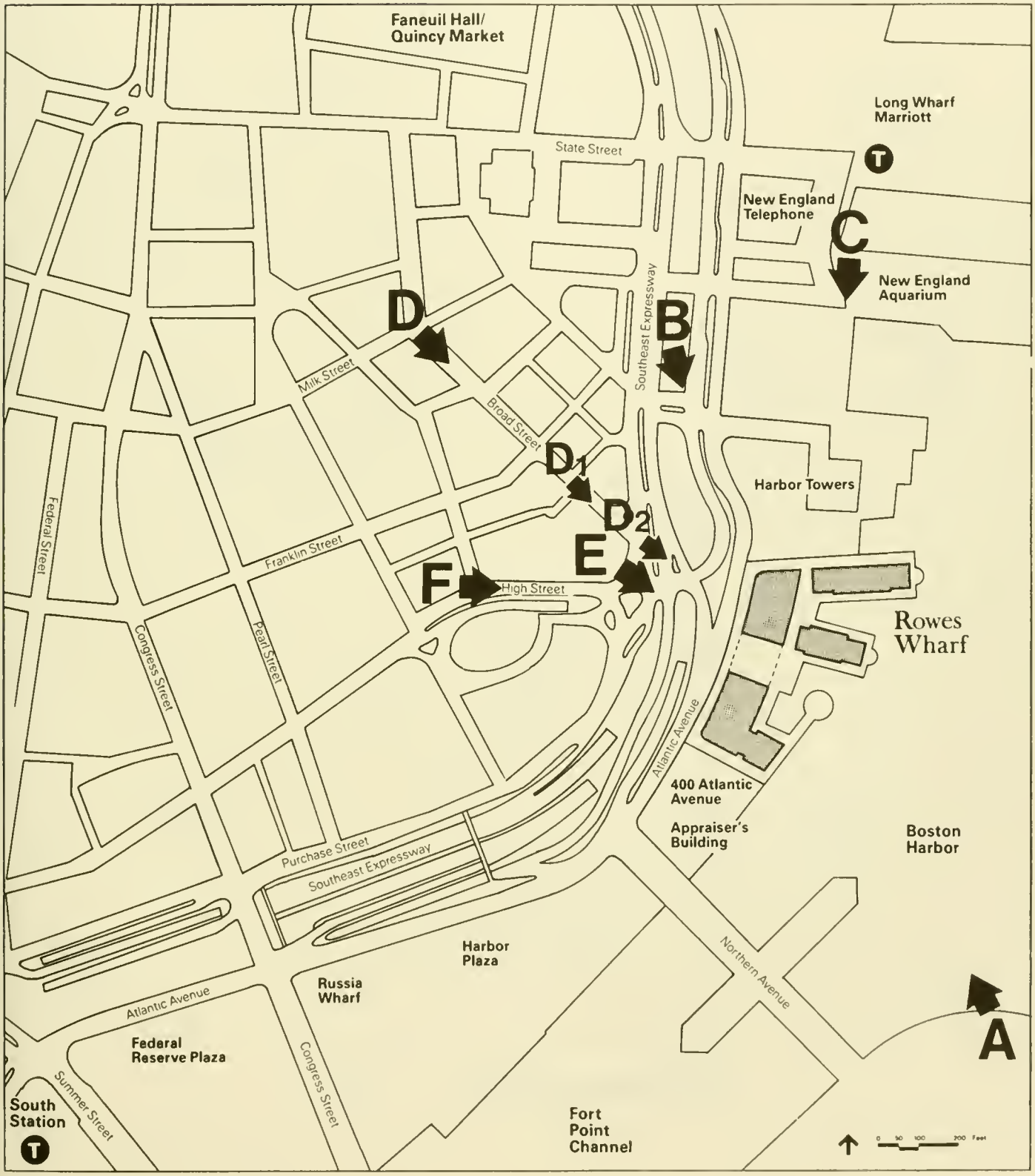


Figure IV-17

Existing On-Site Pedestrian Access

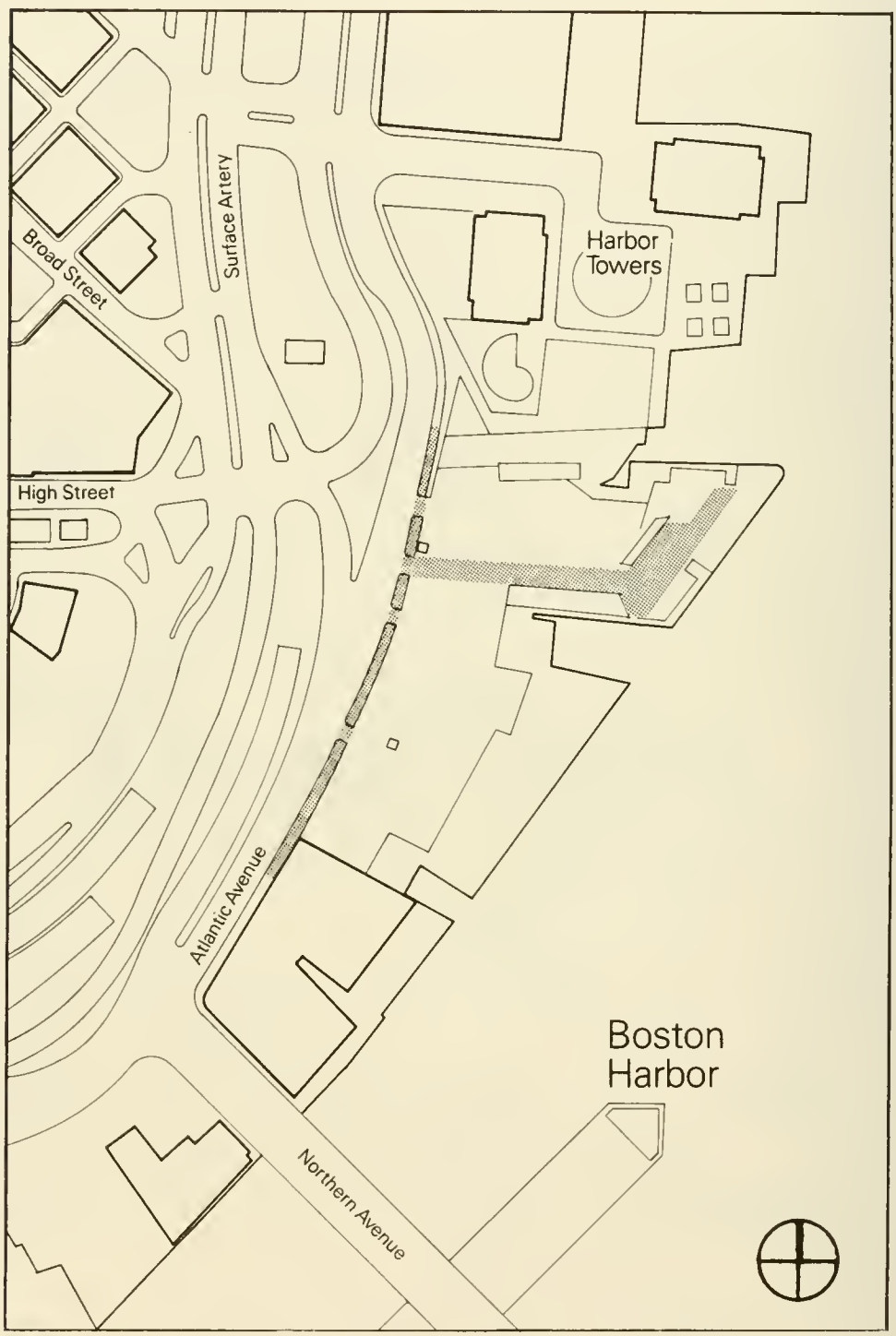
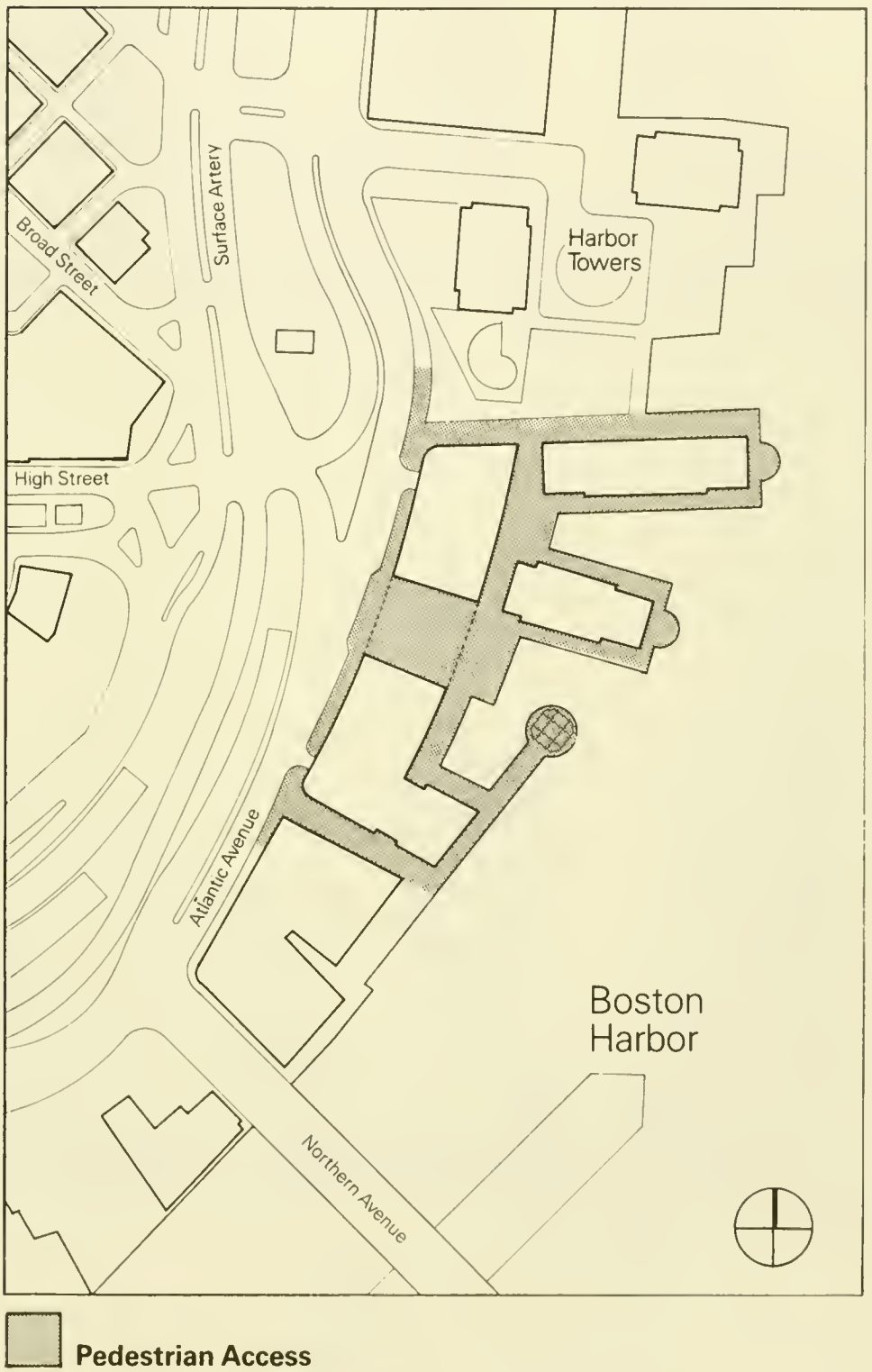


Figure IV-18

Proposed On-Site Pedestrian Access



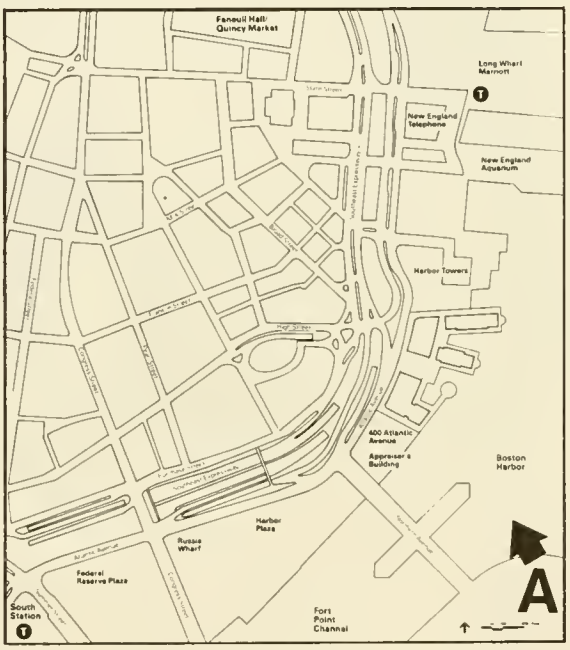
View A
From Harbor

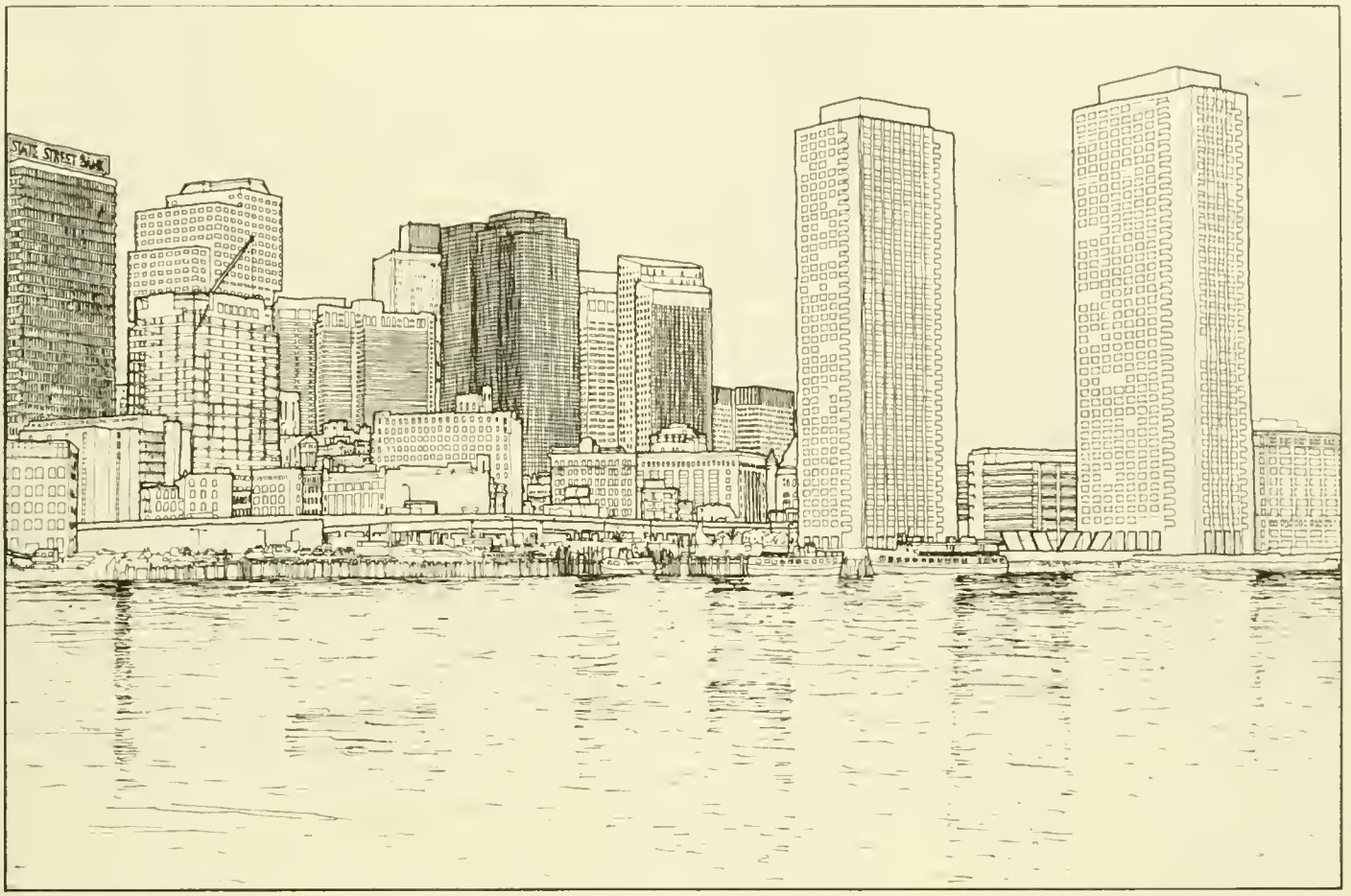
Existing View

This is an eye-level view of Rowes Wharf as seen from Fan Pier. The Boston skyline creates a high-rise backdrop for the proposed project. The existing wharf is in a state of extreme disrepair and is of poor visual quality. The public is virtually cut off from the water's edge, with only the occasional ferry providing a hint of any waterfront activity.

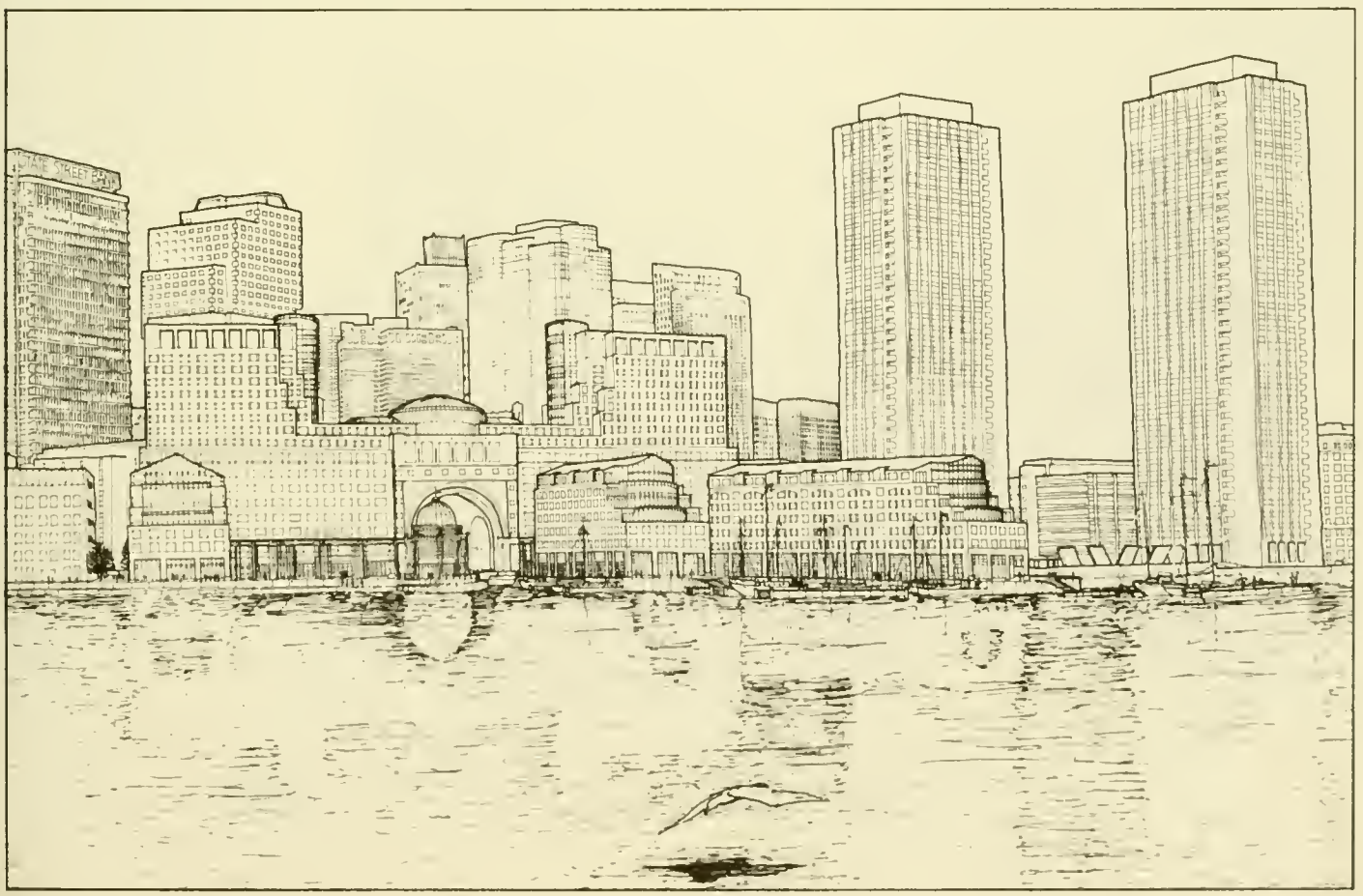
Proposed Project

This view clearly illustrates the relative scale of the proposed project. The scale and mass relate to the existing context and act as a transitional device stepping towards the waterfront. The wharf buildings pick up the theme of the waterfront-pier configuration, and a continuous pedestrian walkway is provided along the water from Harbor Towers south to 400 Atlantic Avenue, creating an important visual and physical link to the walk-by-the-sea. The ferry terminal and marina attract more activity to the waterfront and further strengthen the visual image of the area.





View A - Existing



View A - Proposed

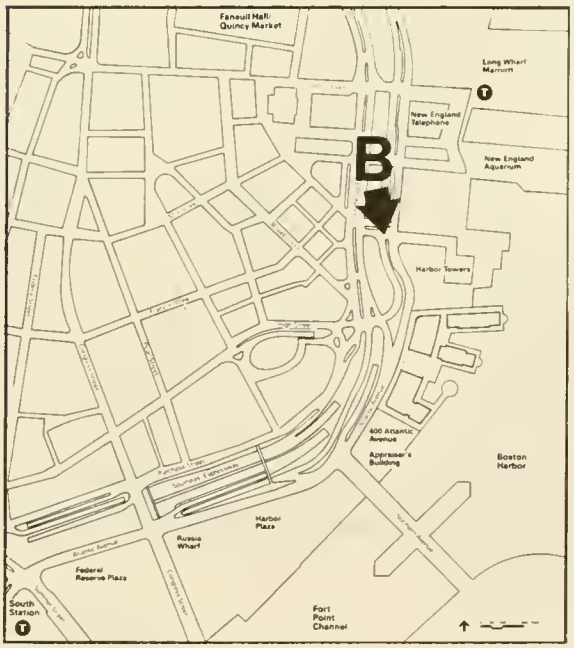
View B
Atlantic Avenue

Existing View

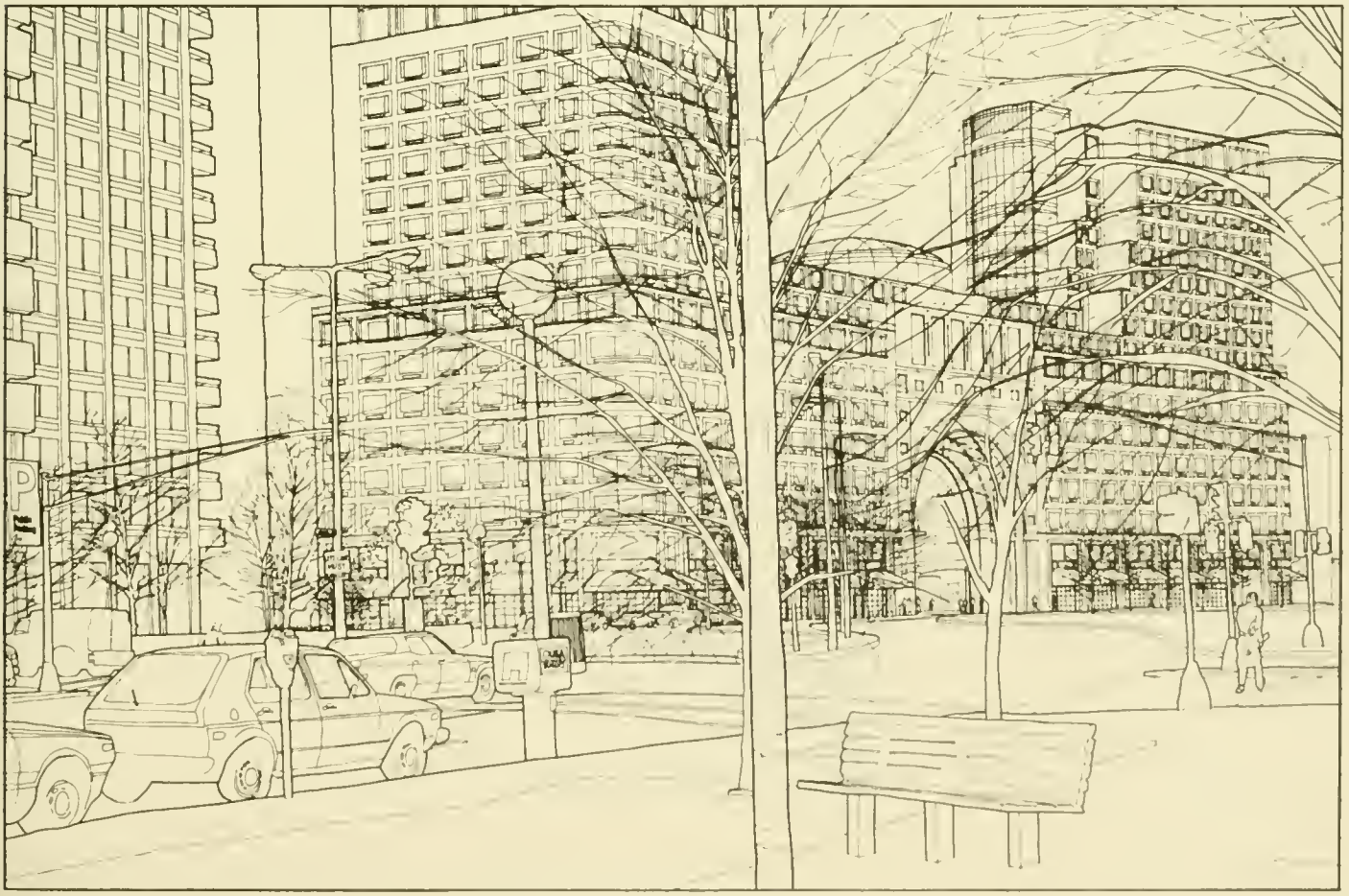
This site view is from Atlantic Avenue in front of the parking garage north of Harbor Towers. It is an important view as it is likely to be experienced when approaching from the heavily-traveled Faneuil Hall Marketplace area. There is a feeling of openness but without clear definition of the land's edge. In fact, the water cannot be seen from here as grade changes and visual obstructions, such as parked cars and trailer-like structures, block visual connections to the Harbor. Also, the traditional building line of Atlantic Avenue is absent, weakening the relationship between the City and the waterfront.

Proposed Project

This is one of the few vantage points from which the entire Atlantic Avenue facade of the proposed development can be seen. In this view, the varied articulation of building masses serves to reduce the apparent scale of the project. Atlantic Avenue is clearly defined by building masses while at the same time, visual and physical connections between the waterfront and downtown are maintained. A glimpse of the north wharf structure can be seen between Harbor Towers and the Atlantic Avenue building. The glass dome and the central entrance court are easily identifiable, as is the trellised Rowes Walk along the east side of the main building. The materials, proportions, and texture of the proposed facade respond to the existing fabric of the contiguous area.



View B - Existing



View B - Proposed

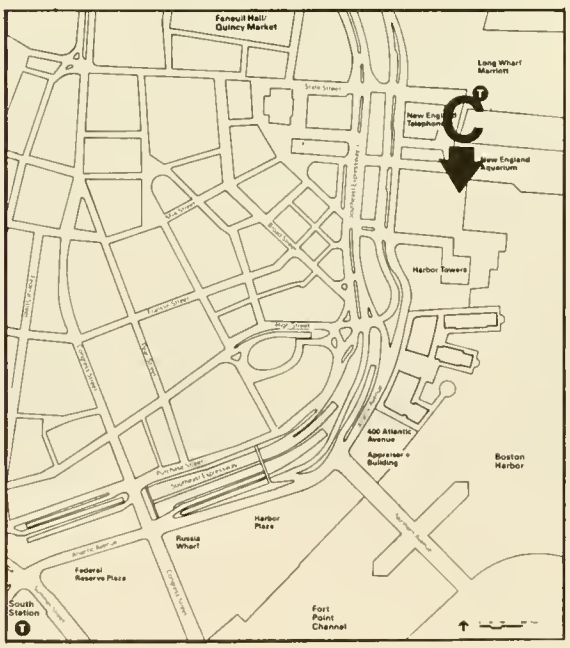
View C
Rowes Walk/
Walk-By-The-Sea

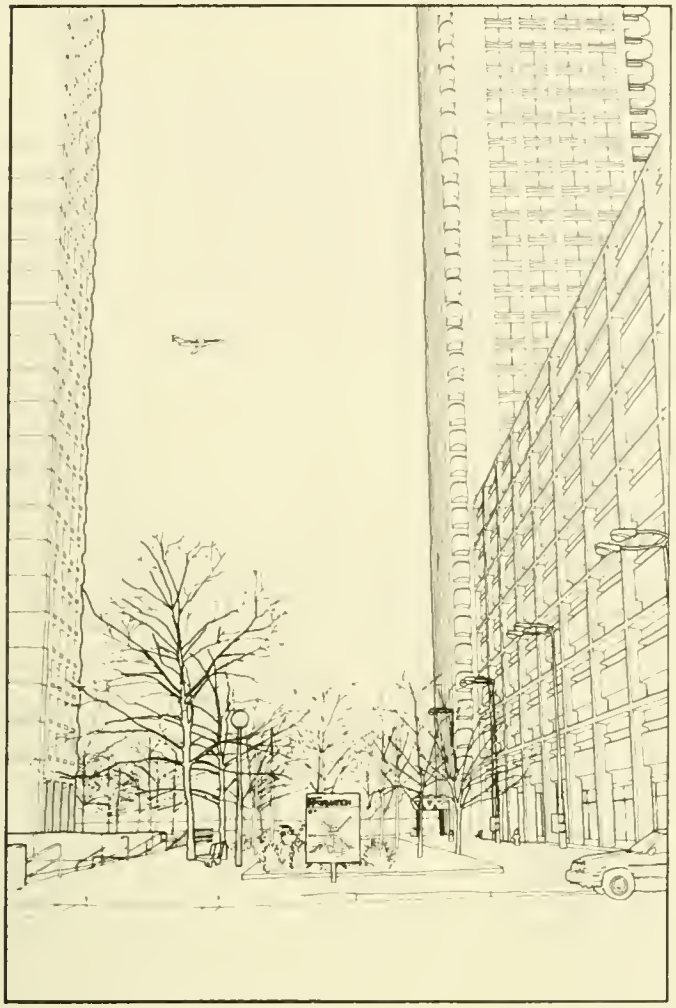
Existing View

This existing vista down the walk-by-the-sea is from the front of the New England Aquarium. Framed by the 40-story Harbor Towers, this view allows a glimpse of the waterfront. The area shown between the two towers is private property and not legally accessible to the public. While currently pedestrians can pass through this space, it fails to physically connect to activities or uses beyond. This path, with no obvious destination, clearly lacks a focus or visual terminus. As a consequence, pedestrians rarely take advantage of this important point of access to the waterfront.

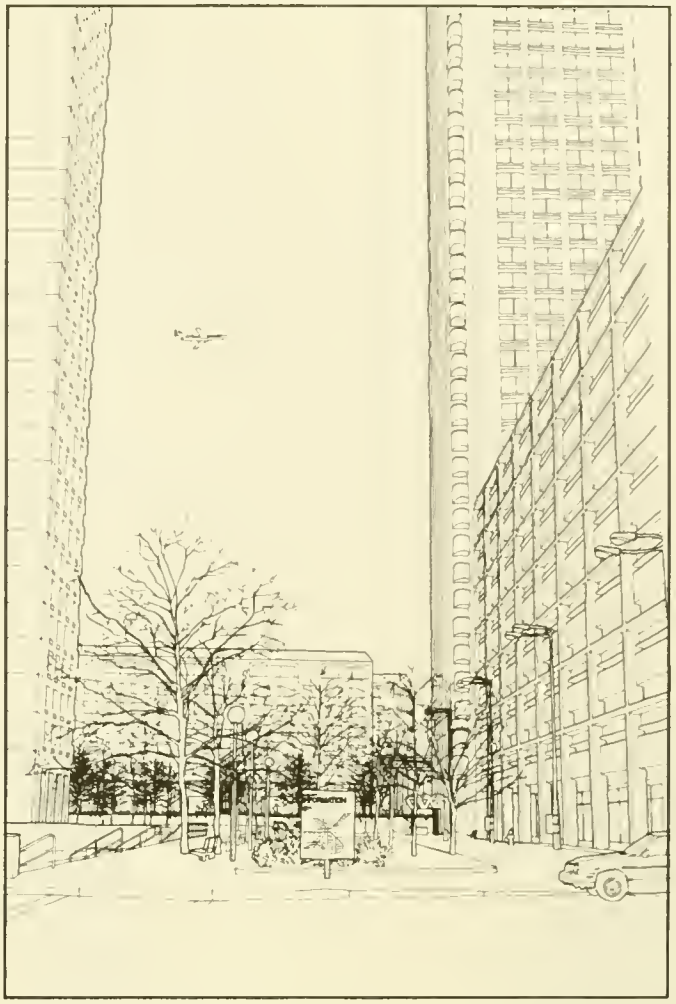
Proposed Project

From this vantage point the proposed project predominately exhibits the low-scale flavor of the residential north wharf structure. The traditional, Boston-waterfront pier configuration is a visual clue and symbolizes the existence of the water's edge beyond. Also visible from this point is Rowes Walk, inviting the pedestrian to move along the wharfs. The massing and flavor of the low-scale residential wharf structures are historically correct and the mid-scale Atlantic Avenue building is neatly set back behind the west Harbor Tower structure. Furthermore, these wharf buildings act as a visual attraction along the corridor while enticing the viewer to move around them, to the west along the trellised Rowes Walk, or to the east along the water's edge. Although views directly to the water are reduced from this vantage point, the proposed project will add a new activity focus to the walk-by-the-sea and make a previously inaccessible waterfront site completely open to the public.





View C - Existing



View C - Proposed

View D, D1, D2 Broad Street

Existing Views

The current view from Milk and Broad Streets illustrates an existing lack of visual linkage between Broad Street and the waterfront. While this vista draws attention towards the water's edge, the elevated Central Artery creates a visual barrier to the Harbor. Even though the viewer can see above and below the highway, there is minimal perception of any connection with the water's edge. Further, the view along this access is primarily of the South Boston Piers across the Fort Point Channel.

Proposed Project

Since the filing of the Draft EIR, an intensive analysis of the Broad Street view has been completed to test various design changes which could expand the view to the water. A solution was sought which would broaden the view without compromising important views through the arch from the Atlantic Avenue and High Street approaches. For instance, the vista down High Street, which connects the waterfront with new development in the Financial District, is also a significant visual link.

The design change which has been implemented expands the Broad Street view without cutting off other water views. As illustrated in the building footprint drawings included here, the outer arch on both the Atlantic Avenue and Harbor sides is widened, allowing for expanded views. The direct view corridor from Broad Street is expanded and many other views are enhanced as well. Although this creates some additional structural costs in the construction of the rotunda, it is judged to be of sufficient benefit to be incorporated in the project design.

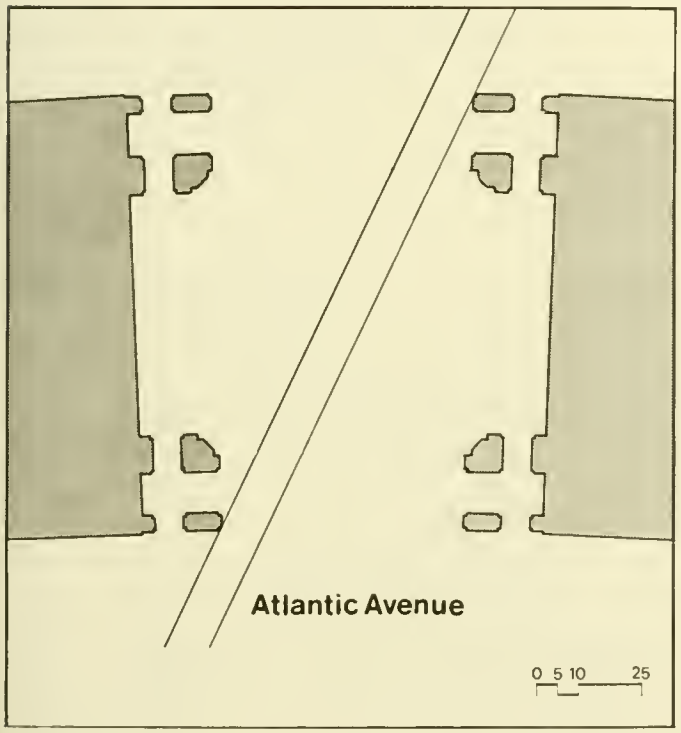
Three successive views of the proposed project as seen looking down Broad Street are included here. In each case, the Central Artery structure is not included so that the orientation of the Rowes Wharf project can be clearly shown. Whether the Artery is depressed or not, the development will continue as an attraction to the water from a variety of City approaches. The first view is near Custom House Street on Broad Street, the second near Franklin on Broad, and the third near the Artery on Broad.

As seen from the drawings, the proposed project provides a visual focus and frame for the views down the Broad Street corridor. Simultaneously, a five-story arched court opens to the waterfront and draws the pedestrian's attention towards the Harbor beyond. This is accentuated by the view across the marina to the glass-enclosed ferry terminal and by the transparent

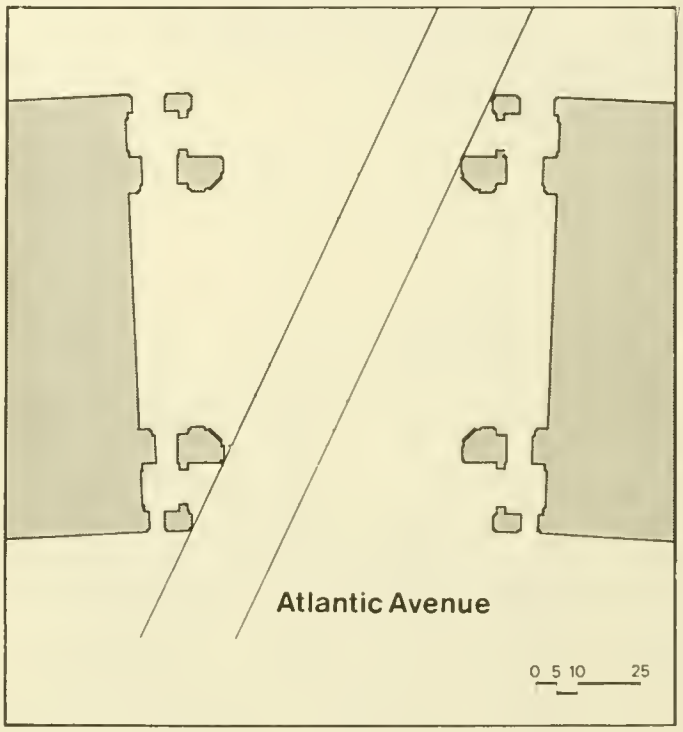
glass-domed rotunda element over the arch that signals an important passage to the sea. As the viewer moves down the street, increasingly large views of the water and activities beyond are experienced.

The north and south towers are not apparent in most of these views. Only the lower scale mid-section of the proposed project will be visible. This portion of the building is 11 stories high (approximately 126 feet) and provides a compatible mass within the scale of the existing context of commercial structures.

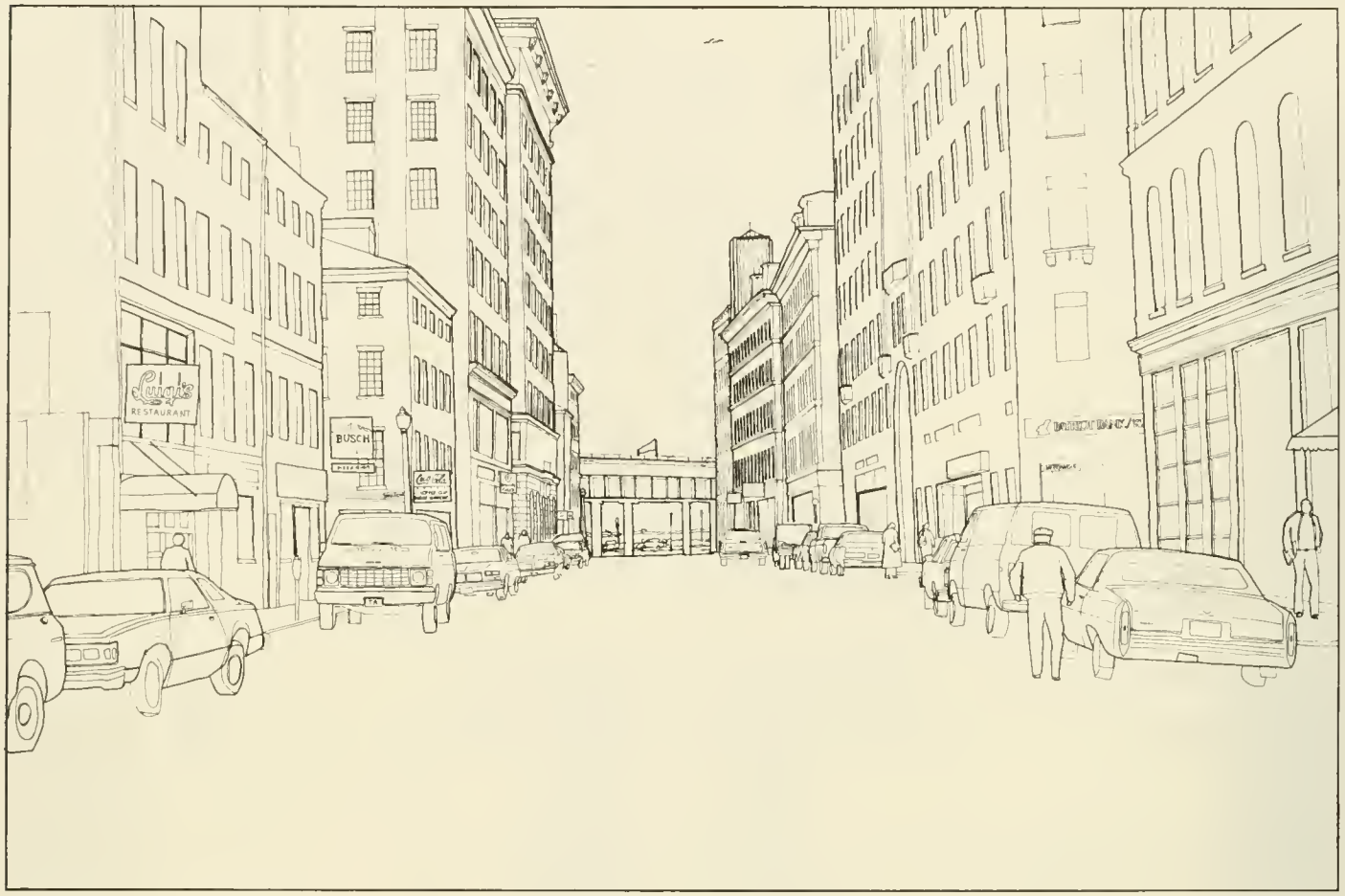
It should be noted that the Massachusetts Historical Commission has reviewed the relationship between the Rowes Wharf project and Custom House Historic District and has concluded that the project does not impact any historic properties. A letter to this effect is included as Appendix 4 of this EIR.



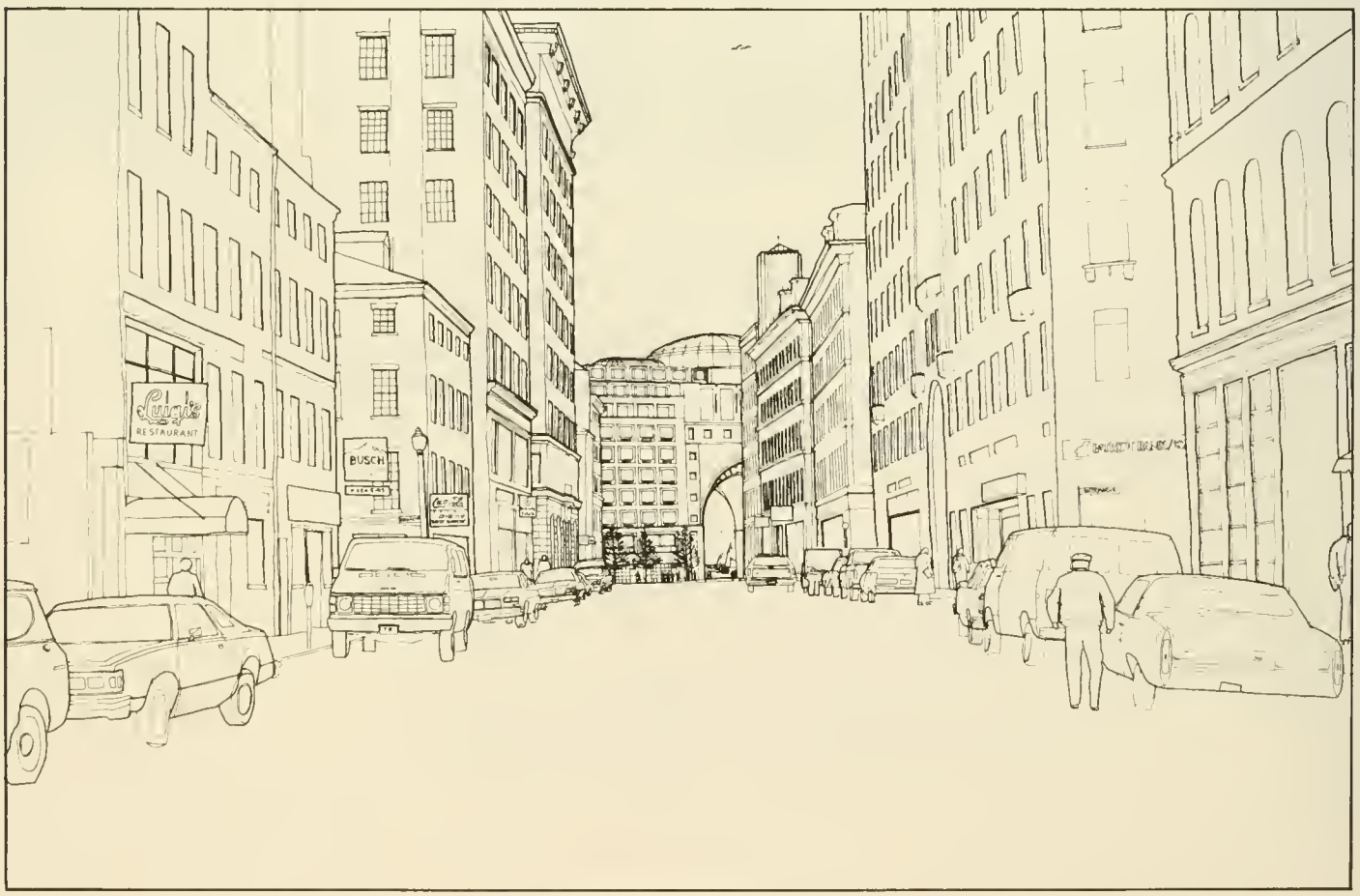
Footprint of Rotunda/Central Arch
as analyzed in Draft EIR



Footprint of Rotunda/Central Arch
as modified for Final EIR

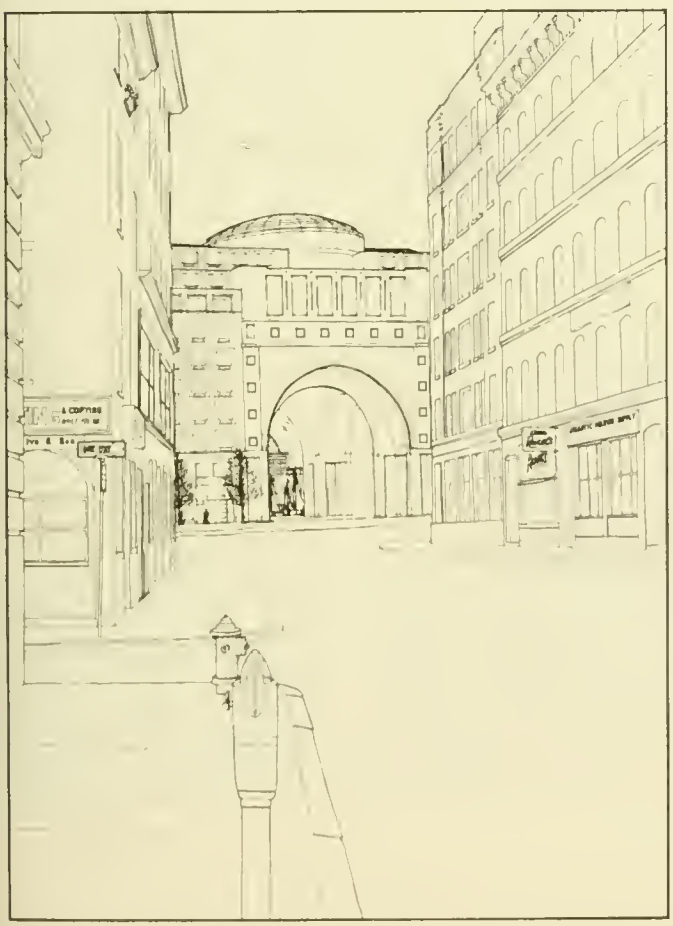


View D - Existing



View D - Proposed

Progression showing view down Broad Street.



View D1

View D2

View E
Broad and High Streets

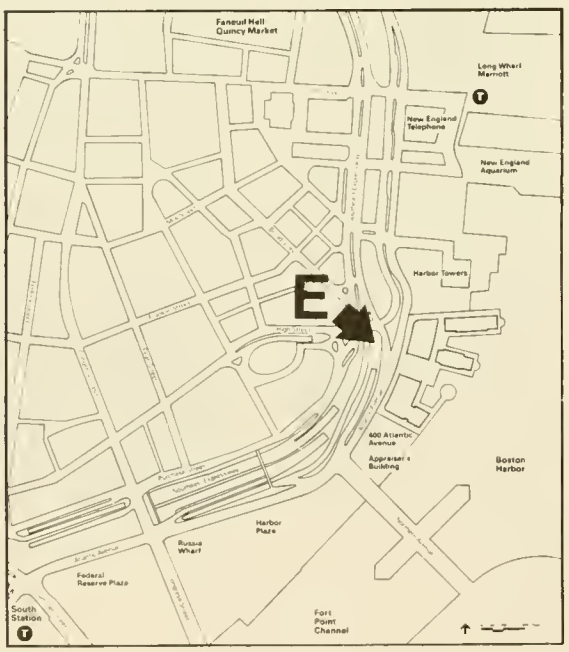
Existing View

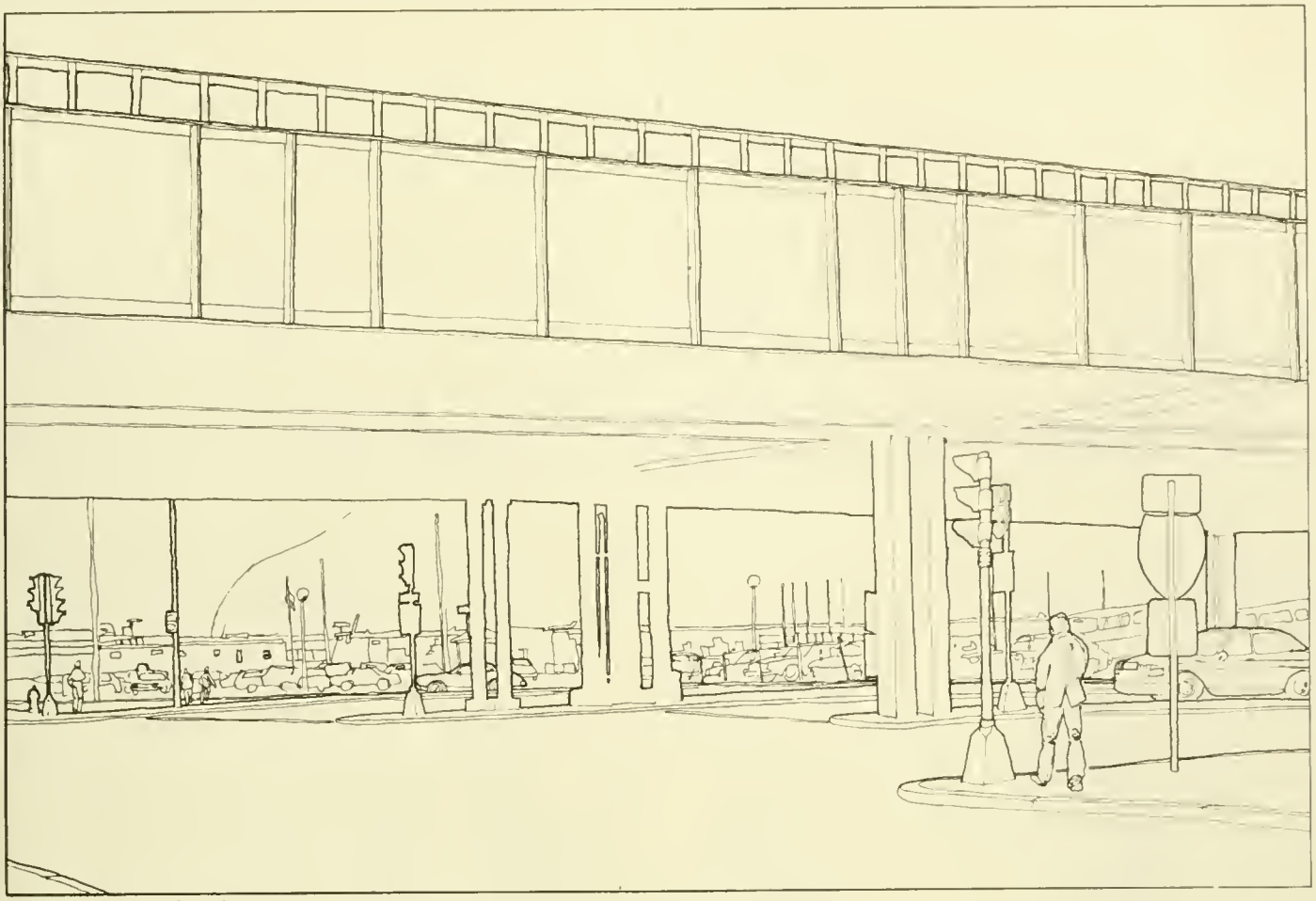
As seen in the accompanying sketch, the Central Artery severs the pedestrian's view of the waterfront. While a view is achieved under the expressway, the perception is one of disorganization, fences, and parked cars. Atlantic Avenue's edge is not defined and only the docked ferryboats hint of public accessibility or activity. There is a clear lack of visual focus that is apparent in most views towards the project site.

Proposed Project

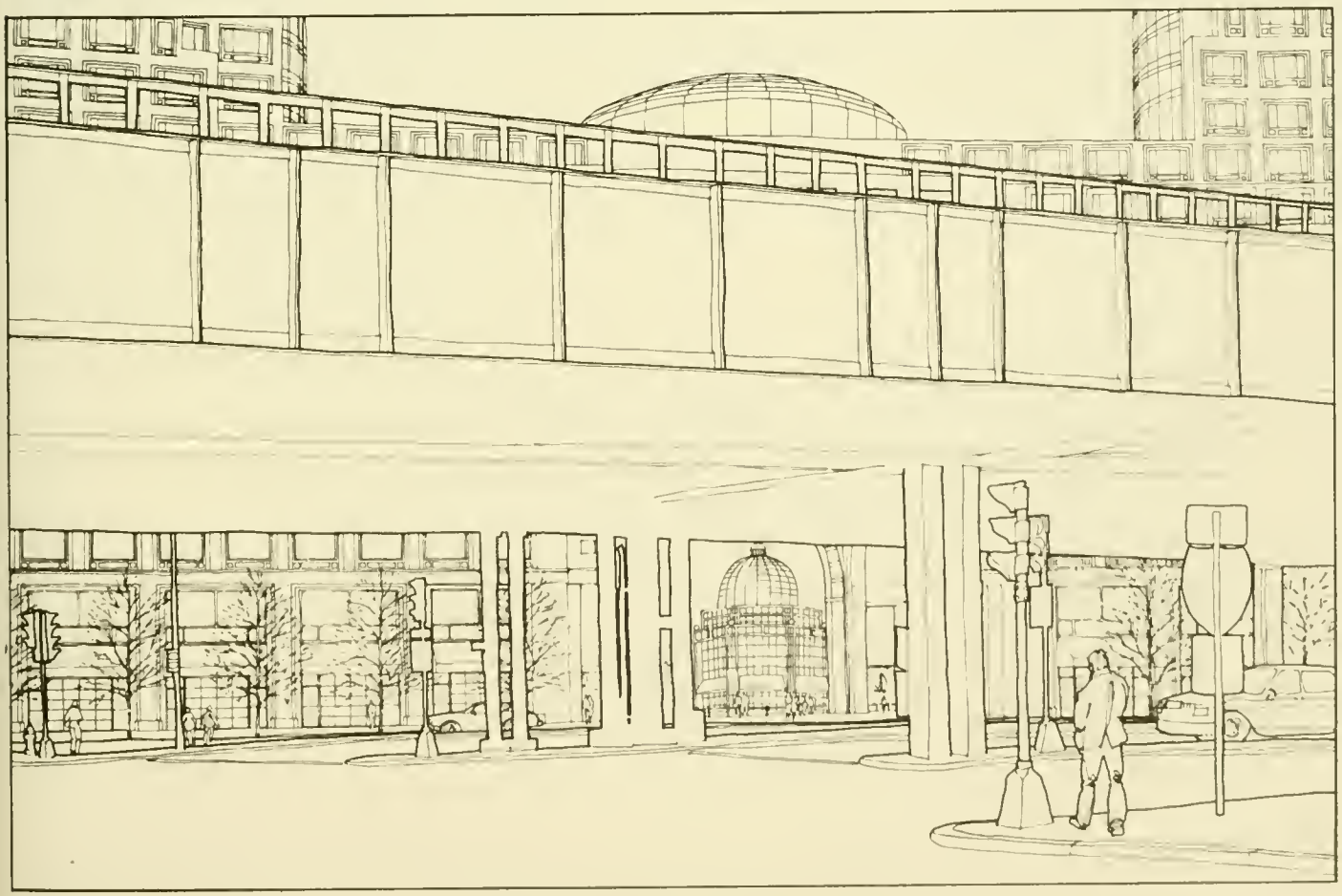
In this view the pedestrian will experience a full view of the ferry terminal through the five-story arched central entrance court. Also, the water itself and thus the activities beyond are easily recognized. As the pedestrian moves closer to Atlantic Avenue, an increasingly panoramic view of the Harbor is achieved. The top of the glass-domed rotunda flanked by the higher portions of the structures is clearly visible, creating a visual attraction to the water's edge. The principal building masses follow the lines of Atlantic Avenue. These masses, cornices, setbacks, and fenestration reflect the lines, openings, and bulk of the surrounding older Boston buildings.

A third sketch is included that illustrates the view from this major pedestrian crossing area, were the Central Artery to be depressed. In this case, views to the water and public awareness of the qualities of the proposed structure would be greatly enhanced.

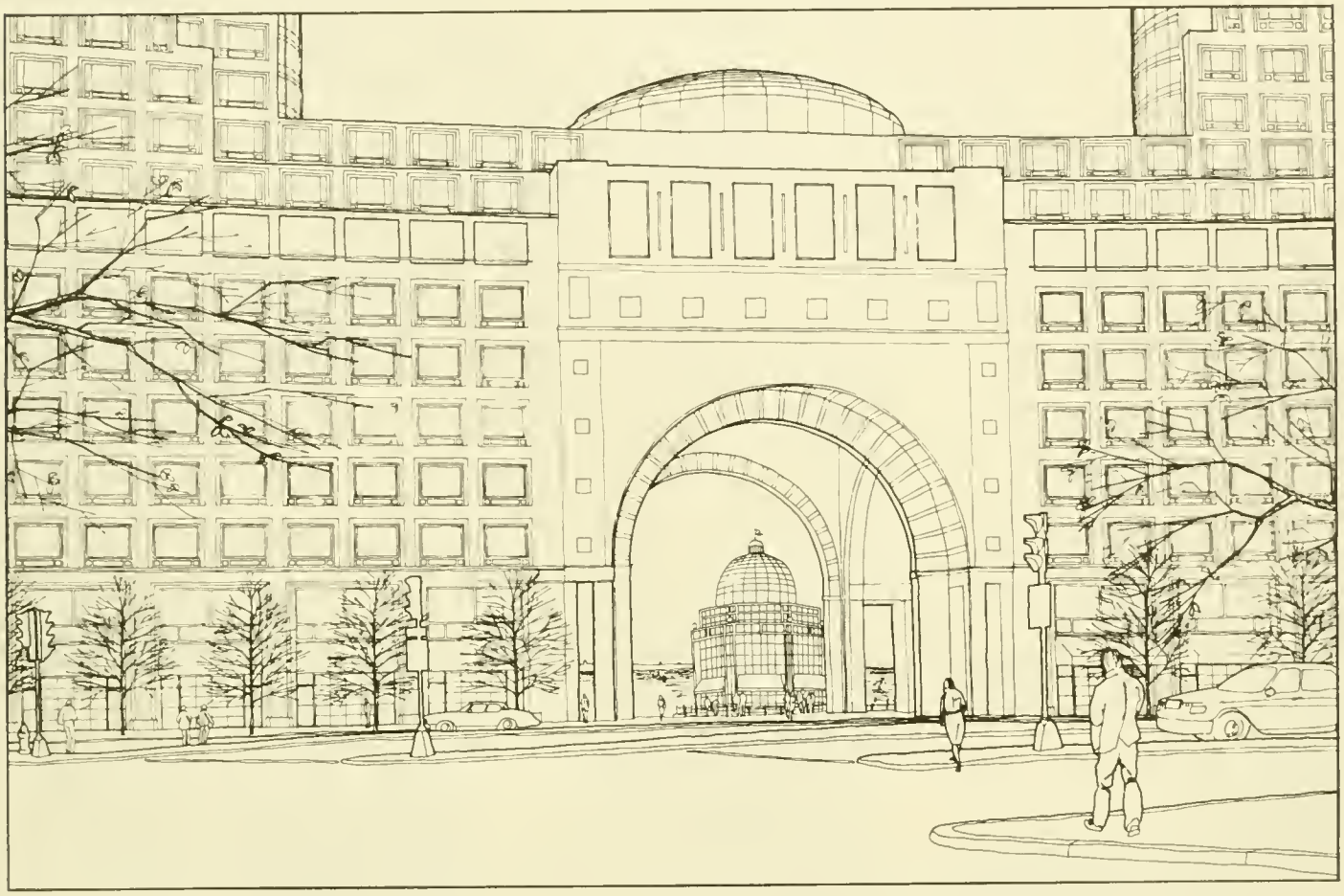




View E - Existing



View E - Proposed



View E - Depressed Central Artery

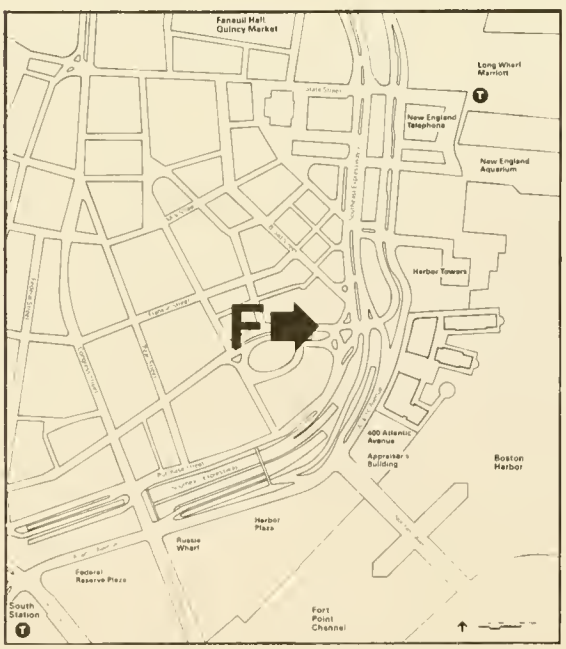
View F
High Street

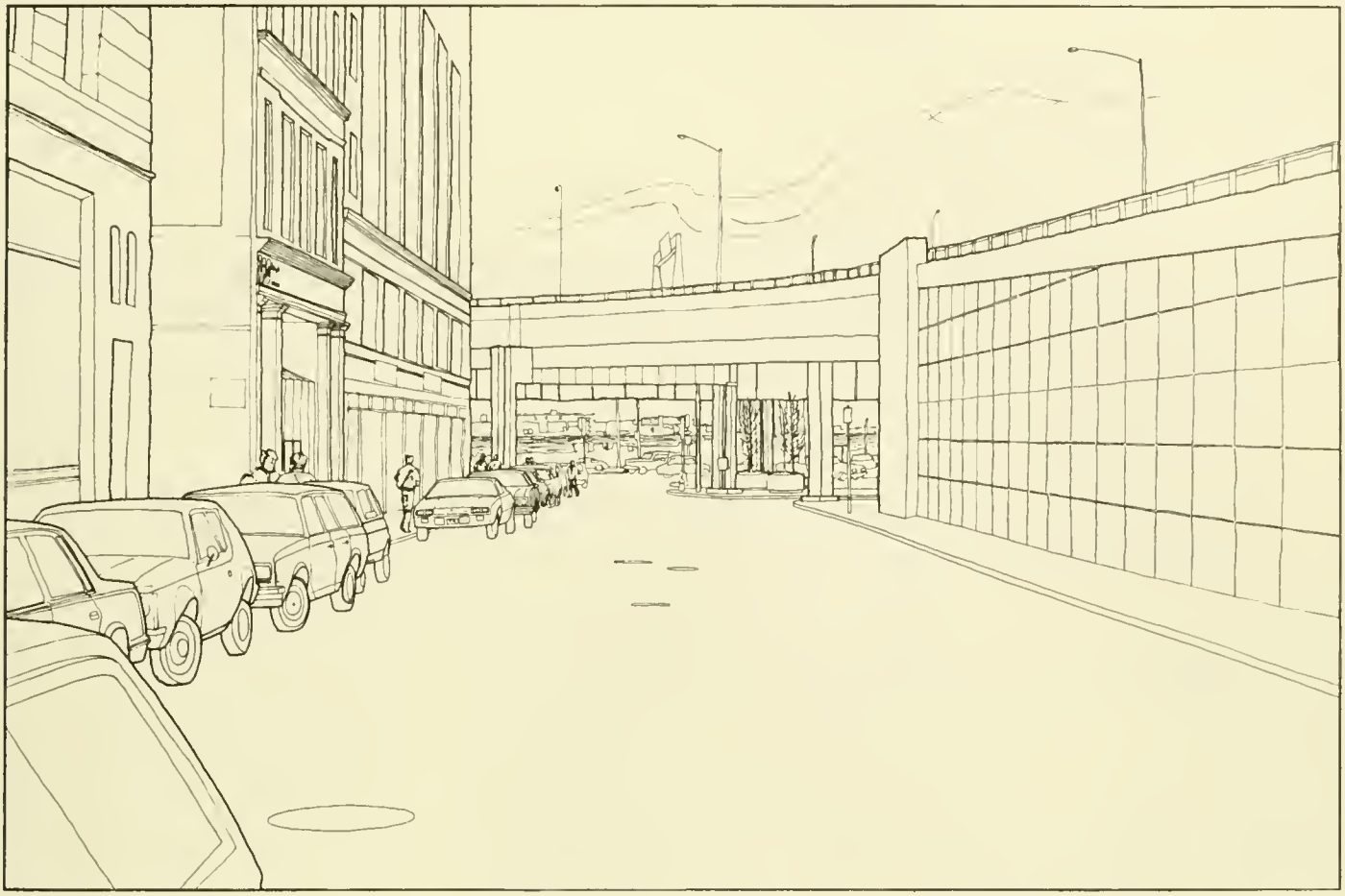
Existing View

This view is taken down High Street from Batterymarch Street. It is similar to the Broad Street vista in that the elevated Central Artery presents a formidable visual barrier to the water's edge. Also, the wall which creates the High Street ramp poses an even greater visual obstruction. Again, parked cars and visual havoc make it difficult to perceive what is happening beyond. The airport tower is visible through the frame of the Artery. The view has no visual focus or terminus and the building edge of Atlantic Avenue is not discernible.

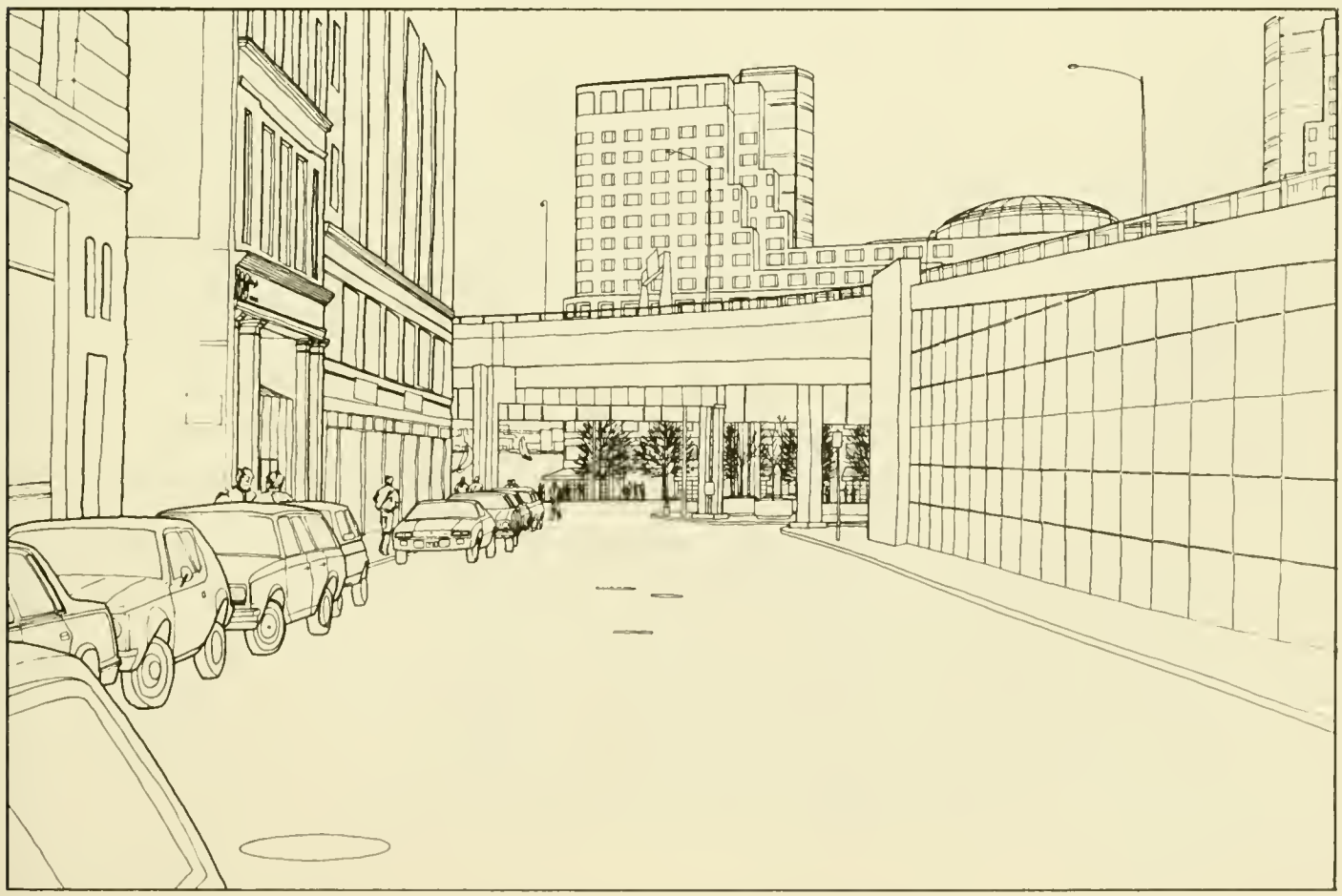
Proposed Project

A long vista through the 30-foot wide northern promenade affords a scenic view to waterfront activities as well as a glimpse of Logan Airport beyond. From here, the control tower should be easily identified. In this case the linear organization of the promenade tends to channel the viewer's attention towards the water, thus creating a framed view and visual connection with the Harbor and drawing the pedestrian to the water's edge. In this view, the northern residential tower also provides a visual focus for High Street. Because of the fenestration, the Atlantic Avenue building line will be clearly perceived as one of retail use/activity at the street level. Even though the elevated Central Artery severs this view, the 16-story masonry tower symbolizes that there is activity beyond. The glass dome and south tower are partially visible behind the expressway ramp, increasing the viewers' curiosity and drawing them towards the Harbor. The masses and fenestration as seen from here reflect the general character and flavor of the existing local fabric. The northern promenade is a key element in the formulation of finger paths to the water and in creating visual linkages with the Harbor.





View F - Existing



View F - Proposed

Wind

INTRODUCTION

As part of the design process established for the Rowes Wharf project, Hansen, Holley and Biggs Inc. (HH&B) and the MIT Wright Brothers Facility were retained to assess the probable effects of the proposed development on the ground wind environment. This action was initiated in the early phases of the design process.

The initial wind analysis was conducted by Dr. Robert Hansen of HH&B, who had previously advised The Beacon Companies on the wind effects of the design of the One Post Office Square, had participated in the resolution of problems at the John Hancock Building, and had consulted on other projects across the United States in his extensive work at the Massachusetts Institute of Technology (MIT). Dr. Hansen compiled data on the existing wind environment and assessed all open space, building entrances, and other areas for potential wind problems at various times of year. In response to Professor Hansen's initial report, the Rowes Wharf design team adjusted the early schematic design to ameliorate potential problems.

For the second phase of the project design, the Wright Brothers Facility at MIT was commissioned to conduct detailed wind tunnel studies to further assess the wind conditions at Rowes Wharf. Tests using both wind erosion and hot-wire techniques were completed and a summary of the results is presented here.

The first part of this discussion covers the methodology used, the equipment employed, the reduction of data, and the identification of wind comfort criteria against which conditions at Rowes Wharf can be evaluated. Next, a discussion of existing wind conditions is provided. Finally, a review of probable project impacts and wind conditions at all major public open space areas is included. All maps showing wind tunnel stations tested and tables of findings by station are included at the end of this discussion for easy cross-reference (Figures IV-19 to IV-31). A detailed report on methodology and wind data is available on request as Appendix 5 of the Final EIR.

In summary, wind conditions at Rowes Wharf are predicted to be well within community and international standards for pleasant open spaces. Winds are slightly increased over existing conditions on the site and conditions at neighboring pedestrian areas are somewhat improved with the proposed development.

METHODOLOGY

The wind tunnel investigation of pedestrian-level winds in the proposed complex was performed in the Wright Brothers Memorial Wind Tunnel (WBWT) of the Department of Aeronautics and Astronautics at MIT. Two methods were used to study the pedestrian-level winds: one in which the erosion of rice-sized particles spread over the modeled area were photographed for different wind speeds and directions (Tests 1 and 2); and a second in which hot-wire anemometers were used to measure the actual wind velocities at up to 32 stations (Tests 3 through 6).

An existing model of downtown Boston was updated by adding 260 and 265 Franklin Street, and Market Place Center, all currently under construction, as well as a model of the proposed Rowes Wharf project.

Between the erosion and hot-wire tests, the model of the Rowes Wharf complex was revised to account for the changes in building height and wharf configuration that occurred in the time interval between the test programs. Also, a model of the proposed International Place at Fort Hill was built and used in Test 4.

For each test, the model was placed in an appropriately simulated earth's boundary layer flow in the wind tunnel. For the erosion tests, the state of erosion of small plastic particles was recorded photographically at seven wind speeds for each of twelve wind directions. In the first erosion test (Test 1), the model was tested with the Rowes Wharf site as open space, as it is currently. In the second erosion test (Test 2), the model was tested with the Rowes Wharf Development in place. International Place was not included in either test. 105 stations were examined, 73 within the complex, 18 near the complex, and 14 away from the complex (see Figures IV-19 and IV-20 at the end of this Section).

For the hot-wire tests, pedestrian-level winds were measured for the 16 major compass directions at up to 32 stations for four different configurations. These configurations and tests were designed to provide reference data for the erosion tests, and to determine the effects of: (i) the changes in design of the Rowes Wharf complex incorporated after the initial erosion tests (ii) the proposed International Place complex, and (iii) two potential tree configurations designed to

mitigate the winds along the northern promenade. The revised model of the Rowes Wharf Development was used in all four tests. The wind tunnel tests performed are summarized in the following table.

SUMMARY OF TESTS PERFORMED

Test No.	Type Test	Rowes Wharf Model	Inter-national Place	Tree Configu-ration	See Figure Number
1	Erosion	None	No	None	IV-19, IV-20
2	Erosion	Original	No	None	IV-19, IV-20
3	Hot Wire	Revised	No	None	IV-21
4	Hot Wire	Revised	Yes	None	IV-22
5	Hot Wire	Revised	No	1	IV-23
6	Hot Wire	Revised	No	2	IV-24

The Experimental Equipment

All testing was done in the Wright Brothers Memorial Wind Tunnel in a scaled simulated earth's boundary layer. The 1:400 scale model of the City of Boston which was used included all major downtown buildings and the Rowes Wharf Development. Those sections of the model that would not fit on the turntable were added upstream or downstream of the turntable whenever appropriate.

The wind tunnel and other equipment used are described in more detail in Appendix 5, Section I. The characteristics of the simulated earth's boundary layer and the scaling for time are provided in Section II of this Appendix. Appendix 5 also provides additional data on the wind erosion technique and hot-wire techniques utilized.

Reduction of Data

The Reduction of the Erosion Data

The primary results of an erosion study are the sequential photographs of the model and the eroded particles for each velocity and direction. All the photographs were examined and the gradient velocity, at which the particles were blown away from each station, recorded.

The erosion velocities for each station and wind direction were then used with a statistical description of the Boston wind climate in order to calculate the peak gust velocity that will be exceeded once an hour one percent of the time at each station, i.e, once in 100 hours or about three or four times a month during the daylight hours. Also of critical importance is the determination of which wind direction(s) contribute significantly to the total one percent probability. To that end, the percent contribution to the total one percent probability of each wind direction was also calculated and is provided in an extensive series of tables in Appendix 5: Wind. The peak gust velocities and prevalent wind directions for the existing conditions and the conditions with the Rowes Wharf Development are discussed later in this Section.

This data can also be used to estimate during which season a station will be windy. In Boston, the winds tend to come from the northwest quadrant in the winter, the southwest quadrant in the summer, and from the east during percipitation in storms. Thus, one station may be subject to wind effects both during storms and in the summer, and may demonstrate windy conditions only in winter months.

In evaluating the erosion results, it should be noted that the erosion data used to calculate the one percent exceedance peak gust velocities was measured in five mph increments. Findings, however, demonstrate the repeatability of the erosion results and reasonable agreement between the erosion and hot-wire results considering the qualitative nature of the erosion technique.

The Reduction of the Hot-Wire Data

The average, root mean square (rms), and peak gust velocities were obtained in the hot-wire studies. From that data, an effective peak gust (average plus 1.5 times the rms) was calculated. Previous studies have established this approach as an acceptable basis for the guideline of acceptable wind conditions currently used by the BRA.

Next, the measured average, effective peak gust, and peak gust velocities were combined with an appropriate statistical description of the Boston wind climate (see Wind Appendix 5, Section III) to calculate the hourly

average velocity, the effective peak gust velocity, and the peak gust velocity that will be exceeded one percent of the time at each station (i.e., once in a 100 hours or about three to four times a month during daylight hours).

Comfort Criteria

Two sets of comfort criteria are applied in the evaluation of results from testing of the Rowes Wharf complex. These are the BRA Guideline Effective Peak Velocity and Melbourne's Criteria.

BRA Guideline Effective Peak Velocity

The BRA Guideline, based upon effective peak velocity, has been developed over a number of years and a series of wind tunnel tests for specific sites in Boston. The Guideline seeks to maintain wind conditions where the effective gust velocity of 31 mph is not exceeded more than one percent of the time. This can also be described as a 100-hour return period effective gust velocity since it would be anticipated to occur once in every 100 hours.

A review of past studies used to establish this current Guideline indicates that the effective peak velocity is defined by average plus 1.5 times the rms. This Guideline velocity can also be converted to apply to the average and peak velocities used in this analysis. When that is done, the criteria for the 100-hour return period becomes:

Average velocity	22 mph
Effective peak velocity	31 mph
Peak velocity	43 mph

Only the peak velocity criteria can be applied to the erosion data, but all three criteria are applicable to the hot-wire data. Since the average, the effective peak, and/or the peak velocity can all or each make a station appear windy, if any one of the limits is exceeded by the appropriate velocity, then for the purposes of this report, the station is regarded to have exceeded the Guideline velocity.

Melbourne's Criteria

The second set of criteria applied in this study was developed by W. H. Melbourne and has been in use at the Wright Brothers Wind Tunnel for about six years. In 1978, Melbourne[1/] reviewed the literature to find a probablistic criteria for hourly average pedestrian level winds that would cover different types of human activity as well as safety considerations. The results of that study are summarized in Figure IV-25. The vertical scale is the average hourly velocity in miles per hour and the horizontal scale is the probability based on hours of that average velocity occurring. Five criteria are given and labeled. They are "unacceptable and dangerous", "uncomfortable for walking", "acceptable for walking", "acceptable for short periods of standing", and "acceptable for long periods of standing or sitting". Melbourne's criteria can also be modified to apply to both the effective peak gust as well as the peak gust.

When Melbourne's criteria are applied to the 100-hour effective peak gust and peak gust velocities calculated in this analysis, the criteria can be stated as follows:

MELBOURNE'S CRITERIA FOR 100-HOUR RETURN PERIOD

CATEGORY	VELOCITIES		
	Hourly Average	Effective Peak Gust	Peak Gust
1 Unacceptable/Dangerous	$27 \leq Uav$	$39 \leq Uep$	$55 \leq Upk$
2 Uncomfortable for Walking	$19 \leq Uav < 27$	$27 \leq Uep < 39$	$37 \leq Upk < 55$
3 Acceptable for Walking	$15 \leq Uav < 19$	$21 \leq Uep < 27$	$30 \leq Upk < 37$
4 Stationary Short Exposure	$12 \leq Uav < 15$	$16 \leq Uep < 21$	$23 \leq Upk < 30$
5 Stationary Long Exposure	$Uav < 12$	$Uep < 16$	$Upk < 23$

1/ Melbourne, W.H., and Joubert, P.N., "Problems of Wind Flow at the Base of Tall Buildings," Proceedings of the Third International Conference on Building and Structures, Tokyo, Japan, 1971.

The threshold velocity between Category 2 (uncomfortable for walking) and Category 3 (acceptable for walking) is established as the threshold for comfort and is used with the BRA Guideline velocities in this analysis. Based upon this threshold, the following table is equivalent to that given for the BRA Guideline above:

Average velocity	19 mph
Effective peak velocity	27 mph
Peak gust velocity	37 mph

Thus, Melbourne's criteria is somewhat more restrictive than the BRA's Guideline criteria for effective peak gusts.

In this analysis, only the hourly average, effective peak gust, and peak gust that occur once in 100 hours ($P = 0.01$) will be used. However, each value listed really defines a complete curve like those in Figure IV-25 passing through that point ($P(U > Up) = 0.01$).

DESCRIPTION OF THE ENVIRONMENT

As noted above, the wind climate data used in the wind tunnel analyses to obtain estimates of the 100-hour return period winds is based upon twenty years of data collected at Logan Airport. A wind tunnel test was completed using the downtown model and the existing conditions on the Rowes Wharf site. This test (Test 1) is used as a comparison for the analysis of predicted wind conditions with the Rowes Wharf project in place. Figure IV-26, included at the end of this wind section, provides a full description of existing conditions for the 105 stations tested within the Rowes Wharf complex, near the complex, and far from the complex.

Findings as to wind conditions on the existing vacant site indicate no violations of the BRA Guideline peak gust velocities. In addition, all stations fall within Melbourne's criteria as "acceptable for walking" or better. Near the Rowes Wharf site, stations which indicate wind conditions exceeding the BRA Guideline are located at the foot of Harbor Towers (Stations 88 and 91) and at the northern end of the walkway at the Harbor side of the 400 Atlantic Building (Station 74). In the area tested away from the project, no exceedances of BRA or Melbourne's criteria are indicated.

PROBABLE PROJECT IMPACTS

The detailed wind tunnel studies performed at the Wright Brothers Wind Tunnel indicate that, at all locations monitored within and immediately adjacent to the Rowes Wharf Development, the anticipated ground wind environment is well within the guideline velocities established by the BRA.

Furthermore, when evaluated against the more restrictive criteria suggested by Melbourne, and retested on the more precise hot-wire tests, all stations on the Rowes Wharf site are within Melbourne Category 3, acceptable for walking. The erosion tests indicated that there was one location precisely on the threshold between Category 3 and Category 2, which is defined as uncomfortable for walking. However, later hot wire tests (Test 3) with the new project configuration indicate no exceedance of Melbourne's criteria. This location is on the central wharf and is affected by northeast storms and by warm summer winds.

Generally, the wind directions that will lead to the most uncomfortable wind conditions are associated with northeasterly storms, which are frequently accompanied by intense rain or snow. In addition to the northeasterly storms, winds from the northwest also affect areas of the site. The northwest winds are most frequent in the winter and are sometimes associated with very cold weather.

The nearby locations at the base of Harbor Towers (Stations 88,91) are also affected by both the northeast storms and the wintry northwest winds. These wind conditions are considerably more severe than those anticipated at any Rowes Wharf station.

Figures IV-26 to IV-31 included at the end of this discussion, display the findings of the erosion and hot-wire tests (Tests 1-6) completed for this analysis. In each case, the information is organized by area of interest (e.g., "Northern Promenade" or "Along Atlantic Avenue"), a comparison with previous tests or existing conditions is provided, and the appropriate BRA or Melbourne criteria is indicated. The maps, also included at the end of this Section, indicate the physical location of each station tested. The following discussion provides an area by area evaluation of these findings in terms of project effects on the environment. Predicted wind velocities, wind directions, weather, and relevant criteria are all considered.

Group I -- Areas within the Rowes Wharf Development

Atlantic Avenue. Stations located along Atlantic Avenue (Stations 47-51 and 54-58) show no violation of BRA criteria and are all within Melbourne's Category 3, acceptable for walking. The wind directions which affect this area vary as one moves along Atlantic Avenue. Areas south of the central arch are affected primarily by northwest winds. At the central entrance, these effects are balanced by east and southeast winds and at the far northern boundary, northeast storms will also affect wind conditions. Positive effects of summer winds will also be experienced along the Atlantic Avenue sidewalk.

Fosters Court/Rotunda. The central rotunda space (Stations 40-46) is predicted to have no violations of established criteria and in fact to have a relatively benign wind environment acceptable for stationary short or long exposure (Melbourne's Categories 4 and 5). What wind effects are felt will be experienced only under infrequent heavy storm conditions.

South Easement. The walkway at the southern edge of the site shows no exceedance of BRA or Melbourne criteria. The wind velocities in this region (Stations 58-62) place this walk in Melbourne's Category 3, acceptable for walking or better. The wind directions which contribute predominantly to the one percent velocity criteria include northwest winds at the west end of the walkway, east to southeast spring season winds through the center of the walk, and primarily summer southwest winds at the Harbor end.

Northern Promenade. All stations tested along this major walkway (Stations 4-9 and 52-53) are within BRA Guidelines and within Melbourne's criteria as acceptable for walking or short exposure. The areas at Atlantic Avenue and at the entrance to Rowes Walk are slightly windier than other areas and are affected primarily by northeast winds and to some extent northwest storms.

Rowes Walk. This walk will have a benign wind environment being in Melbourne's Category 4, stationary short exposure, and therefore shows no exceedance of BRA or Melbourne criteria. Again, wind directions that contribute to the wind environment vary as one moves north to south along the walk. Station 10 is influenced only by northwest winds, whereas Station 20

is principally affected by northeast storm winds. Station 37 (no data on 38), on the other hand, receives its greatest input from winter northwest winds, and a smaller effect from the southwest summer winds.

Ferry Terminal. The ferry terminal area (Stations 63, 64, 68, 69, 106, and 107) is classified as within Melbourne's Category 4, stationary short exposure, except for Station 107, which is even better as it is stationary long exposure. No violation of criteria are predicted. Stations 63 and 65 are affected almost exclusively by winds from the northeast. Stations 106 and 107, which are on the large floating dock boarding area, are affected mainly by the summer southwest winds.

North Wharf. Erosion and hot-wire tests for the north wharf (Stations 1-3 and 13-17) indicate no exceedances of BRA or Melbourne's criteria. Stations at the southeast end of the wharf, which are relatively windier than others, are in fact primarily affected by northeast storms.

Central Wharf. As noted earlier, wind conditions on the central wharf walkways (Stations 21-33) are predicted to be well within the Guidelines and comfort criteria, with the exception of Station 32 which the erosion studies indicated as on the borderline between Melbourne's Category 2 and Category 3. More precise hot-wire tests of this area, however, indicate a much lower peak gust velocity and no exceedance. In any case, winds affecting this south side of the central wharf are primarily warm southwest winds and less frequent northeast storms which will affect the whole downtown waterfront.

Group II -- Areas Near the Rowes Wharf Development

Locations tested in the vicinity of Rowes Wharf included areas in front of the site within Atlantic Avenue, stations surrounding the 400 Atlantic Avenue Building, and stations on the Harbor Towers site. In the first two areas, conditions are similar to those within the complex and no exceedance of BRA or Melbourne's criteria is anticipated. In fact, significant reductions in winds are expected on the east and west sides of the 400 Atlantic Building, making the walk-by-the-sea an even more attractive public access area.

In the case of Harbor Towers, exceedances of BRA and Melbourne's criteria are anticipated given existing conditions and with the Rowes Wharf complex in place. Effects of the completion of the Rowes Wharf Development are to reduce predicted wind velocities at Stations 88 and 91 at the base of the two towers.

Group III -- Far From the Rowes Wharf Development

These sites include the area surrounding Fort Hill and stations near the Travelers Building and State Street Bank. No exceedances of criteria are predicted in this area for existing conditions or with the Rowes Wharf Development. The area includes Stations 92-105.

Effects of the International Place Development

In response to the request of the Secretary of Environmental Affairs, additional wind tunnel testing was performed to model the effects of the proposed International Place development in combination with the Rowes Wharf Development (Test 4). Figure IV-29 provides the data which resulted from hot-wire tests of 22 stations in and around the two development sites.

Addition of International Place to the wind tunnel had the effect of slightly reducing wind effects along the southern easement of the Rowes Wharf complex. Little or no effect is predicted elsewhere on Rowes Wharf or at Harbor Towers.

Overall, the predicted wind environment at the Rowes Wharf complex is well within community and international standards for pleasant public open spaces and no serious problem areas are indicated. Winds on the site will be slightly increased over existing conditions on the vacant site, but this would be true for any major redevelopment of the site.

MITIGATION MEASURES

Although no serious wind conditions are expected on the Rowes Wharf site, the design and technical team did devote considerable attention to potential mitigation measures which could be applied to make wind conditions even better in the extensive public open space areas planned for the site. Mitigation actions considered included canopies, additional glass enclosures, and

landscaping. Efforts to include setbacks in the building facade to break the wind coming down the facades of the structures had already been applied.

Each of these potential mitigation actions, as applied to a variety of locations on the site, was reviewed with wind specialists and assessments made as to their potential effectiveness, design acceptability, and receptivity to wind tunnel testing. In the case of canopies, some positive effect could be predicted for areas immediately near the building in some locations, but not enough effect to show up in wind tunnel tests. These are still under consideration as part of the continuing design effort. Additional glass enclosures, beyond those judged to be critical to provide protected entrances and lobbies, were judged to be counter to the goal of maximum open air public areas.

Mitigation measures considered to have the potential for significant improvement on the wind environment without contradicting primary design goals included two configurations of dense evergreen trees along the northern promenade. The first analysis, Test 5 (see Figure 23, map and Figure 30, table), included the first row of eleven trees and along the north boundary of the site. Test 6 (Figure 24 and Figure 31) included an additional row of six trees along the Harbor Towers walk-by-the-sea.

Both mitigation tests showed some reduction in wind velocities along the northern promenade. However, the new row of trees also had the effect of increasing wind velocities at the corner of the Harbor Towers building. Since this location on the Harbor Towers site is one of the worst wind conditions in the area and one of the only locations to exceed BRA and Melbourne's criteria, this potential mitigation procedure for Rowes Wharf was rejected and will not be included in the final design.

Design analysis related to facade treatment, canopies, and so forth will continue as detailed design of the Rowes Wharf project proceeds.

Figure IV-19

105 Stations Examined in Wind Tunnel Test–Erosion Technique, Tests 1 and 2 (Original Model)

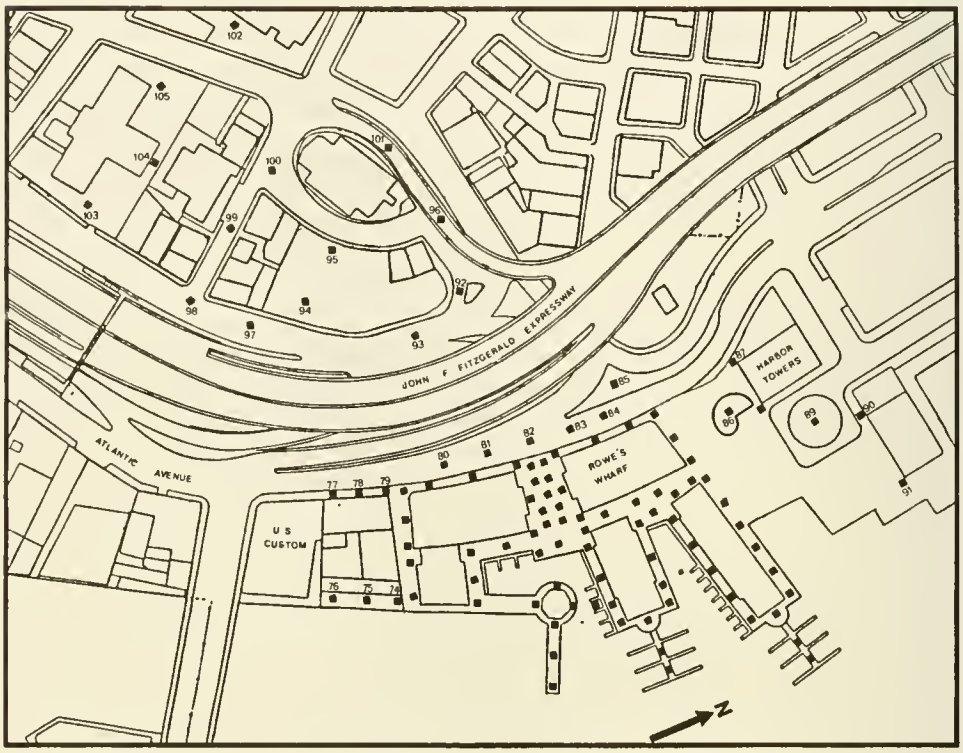


Figure IV-20

Stations Examined within the Rowes Wharf Development–Erosion Technique, Tests 1 and 2 (Original Model)

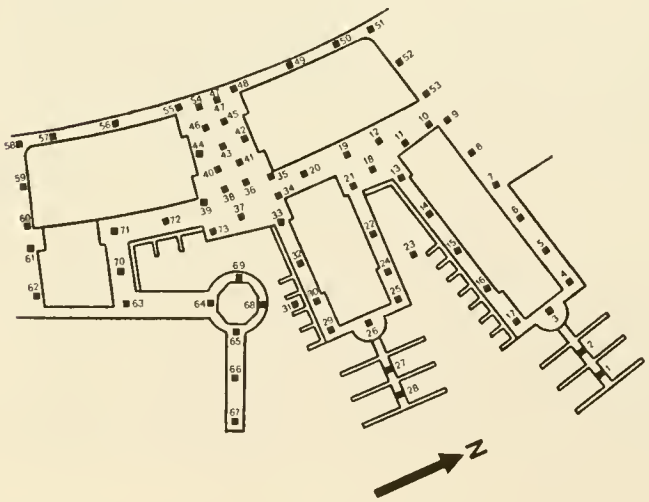


Figure IV-21

Stations Examined–Hot-Wire Analysis, Test 3 Reference Test (Revised Model)

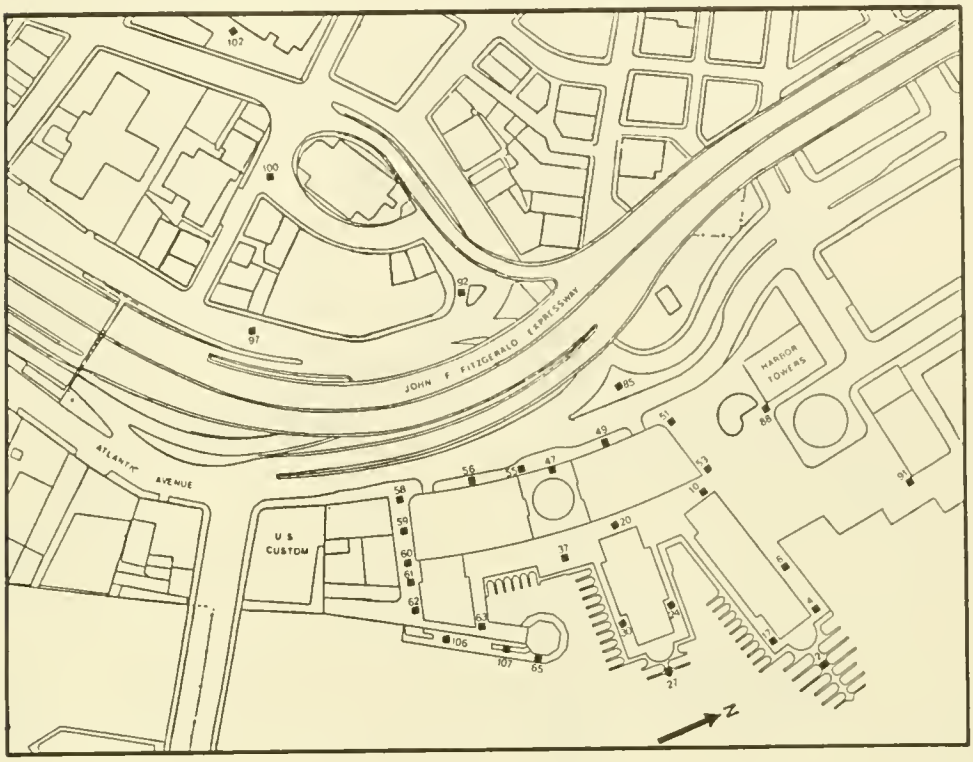


Figure IV-22

Stations Examined–Hot-Wire Analysis, Test 4 International Place Added (Revised Model)

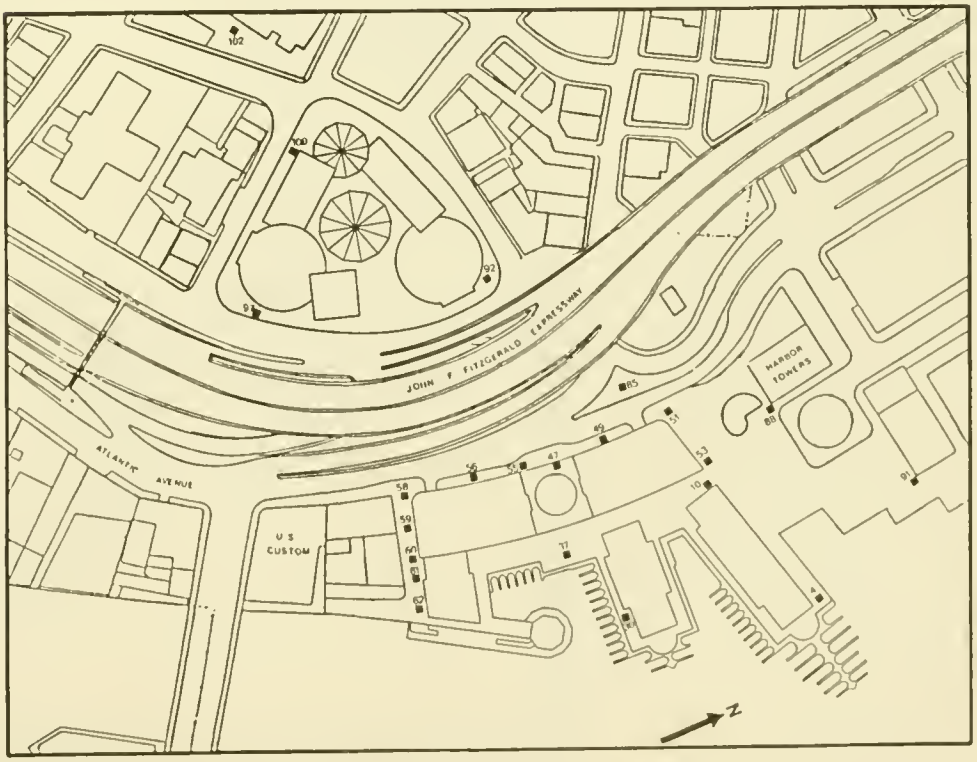


Figure IV-23

Stations Examined–Hot-Wire Analysis, Test 5 First Tree Configuration (Revised Model)

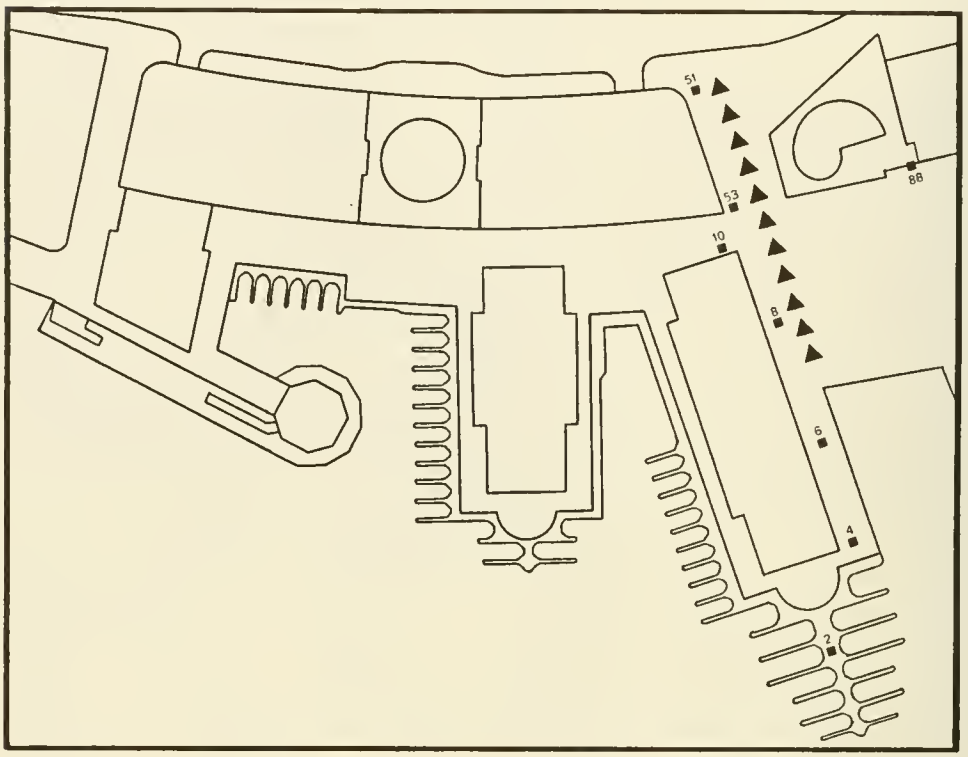


Figure IV-24

Stations Examined–Hot-Wire Analysis, Test 6 Second Tree Configuration (Revised Model)

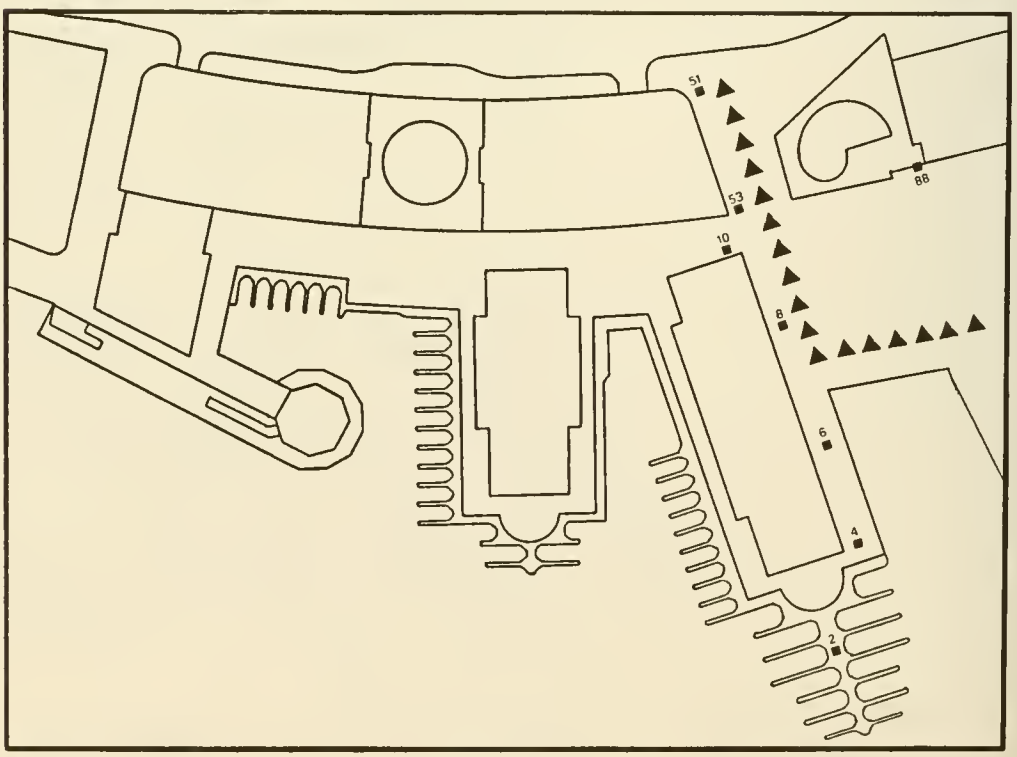


Figure IV-25

Melbourne's Criteria for Average Hourly Pedestrian Winds Compared With Other References

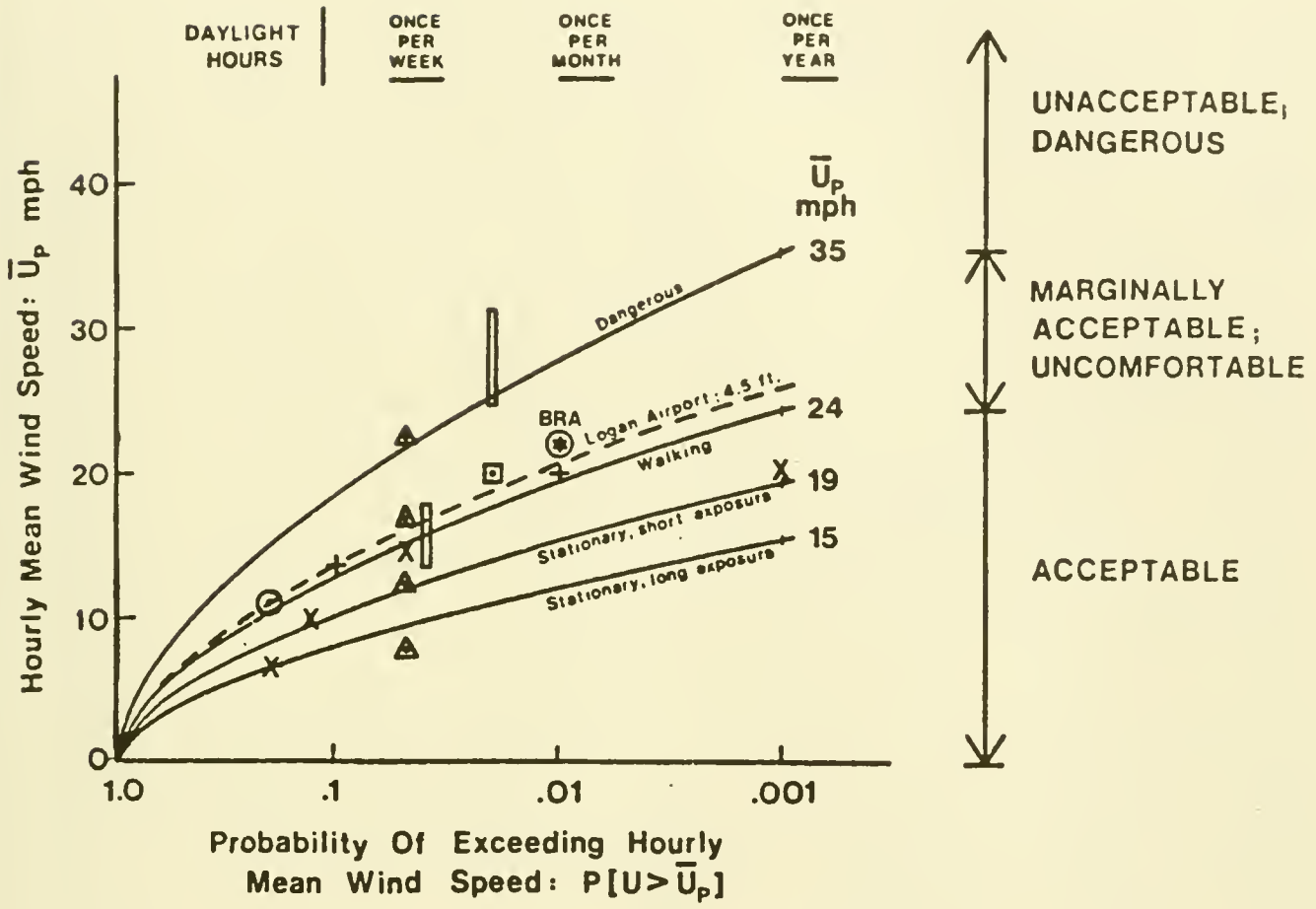


Figure IV-25 con't. Melbourne's Criteria for Average Hourly Pedestrian Winds Compared with Other References

LEGEND		Symbol
CONDITIONS AT LOGAN AIRPORT		- - -
Criteria		
MELBOURNE		———
DAVENPORT		
Acceptable for:		
Walking fast	If $P[\bar{u} > 22.4] < 0.05$	△
Strolling	If $P[\bar{u} > 16.8] < 0.05$	△
Standing, sitting short exposure	If $P[\bar{u} > 12.4] < 0.05$	△
Standing, sitting long exposure	If $P[\bar{u} > 7.8] < 0.05$	△
PENWARDEN AND WIDE		
Acceptable	If $P[\bar{u} > 11.2] < 0.2$	⊙
LAWSON		
Acceptable	If $P[\bar{u} > 13.4$ to $17.8] < 0.04$	═
Unacceptable	If $P[\bar{u} > 24.6$ to $31.3] < 0.02$	═
HUNT, POULTON AND MUMFORD		
Acceptable for Strolling	If $P[\bar{u} > 13.4] < 0.1$	+
Acceptable for Walking	If $P[\bar{u} > 20.1] < 0.01$	+
RADOVSKY AND DURGIN		
Acceptable	If $P[\bar{u} > 20.1] < 0.001$	⊡
COHEN et al		
Unacceptable - limit for safety	If $P[\bar{u} > 20] < 0.001$	X
Acceptable for:		
Walking	If $P[\bar{u} > 14] < 0.05$	X
* Strolling (short exposure)	If $P[\bar{u} > 8] < 0.10$	X
Sitting (long exposure)	If $P[\bar{u} > 5] < 0.20$	X
BRA GUIDELINE*	$P[\bar{u} > 22] < 0.01$	⊛

*Converted to average hourly winds.
ALL velocities in mph.

Figure IV-26

Existing Conditions (Test 1) vs. Proposed Development (Test 2)—Results from Erosion Studies

Group	Area	Station No.	100-Hr. Return Period Peak Gust Velocities (MPH) Test 1 Existing	Test 2 Proposed	Diff.
I Within Development	(1) Along Atlantic Avenue	47	20	24	+4
		48	21	26	+5
		49	22	27	+5
		50	23	26	+3
		51	25	25	0
		54	20	29	+9
		55	19	31	+11
		56	19	26	+7
		57	22	28	+6
		58	27	33	+6
		Average	22	28	+6
	(2) Southern Easement	59	25	29	+4
		60	24	27	+3
		61	30	31	+1
		62	26	32	+6
		Average	26	30	+4
	(3) Foster's Court/Rotunda	40	18	24	+6
		41	21	22	+1
		42	21	21	0
		43	20	22	+2
		44	18	27	+9
		45	20	22	+2
		46	20	26	+6
		Average	20	23	+4
	(4) Northern Promenade	4	30	#	11
		5	28	31	+3
		6	28	34	+6
		7	28	29	+1
		8	24	29	+5
		9	25	27	+2
		52	26	29	+3
		53	26	30	+4
		Average	27	30	+3

Evaluation Criteria

* Melbourne's limit for acceptable winds 37 mph.

** BRA Guideline 43 mph.

\# Incorrectly modeled - data not valid - retested by hot-wire method (see Appendix 5, Section III).

Figure IV-26 Existing Conditions (Test 1) vs. Proposed Development (Test 2) Results from Erosion Studies

Group	Area	Station No.	100-Hr. Return Period Peak Gust Velocities (MPH) Test 1 Existing	Test 2 Proposed	Diff.
I Within Development	(5) Rowes Walk	10	25	34	+9
		11	24	24	+0
		12	23	20	-3
		18	22	23	+1
		19	22	18	-4
		20	22	23	+1
		34	21	30	+9
		35	21	24	+3
		36	21	23	+2
		37	20	21	+1
		38	19	23	+4
		39	19	23	+4
		70	21	26	+5
		71	18	22	+4
		72	19	21	+3
		73	19	25	+6
		Average	21	24	+3
	(6) North Wharf	1	23	#	
		2	23	#	
		3	22	30	+8
		13	24	23	-1
		14	23	26	+3
		15	24	26	+2
		16	27	31	+4
		17	22	36	+14
		Average	24	29	+5
	(7) Central Wharf	21	22	24	+2
		22	21	27	+6
		23	22	23	+1
		24	22	31	+9
		25	19	28	+9
		26	20	#	
		27	23	#	
		28	23	32	+9
		29	21	33	+12
		30	25	31	+6
		31	25	19	-6
		32	22	38*	+16
		33	21	29	+8
		Average	22	29	+7

Evaluation Criteria

* Melbourne's limit for acceptable winds 37 mph.

** BRA Guideline 43 mph.

\# Incorrectly modeled - data not valid - retested by hot-wire method (see Appendix 5, Section III).

Figure IV-27

Melbourne Wind Comfort Category for Each Ground Station – Existing Conditions and With Proposed Rowes Wharf Development

I. STATIONS WITHIN THE DEVELOPMENT SITE (1-73)*

Category	Existing Conditions	Proposed Development
1: Unacceptable - Dangerous	----	----
2: Uncomfortable for Walking	----	32
3: Acceptable for Walking	61	3,5,6,10,16,17 24,29-30,34,53 55,58,61,62
4: Stationary Short Exposure	5-16,30,31, 50-53,68-60, 62-64,68	7-9,11,13-15,1 20-23,25,26,33 38-40,44,46-52 56,57,59,60,63 68-70,73
5: Stationary Long Exposure	3,17-26,29,32-49, 54-57,69-73	12,19,31,37,41 45,71,72

*Stations 1,2,4,27,28,65-68 not included; data invalid in Test 2 (see Appendix 5). Areas retested with hot-wire study.

II. STATIONS NEAR THE DEVELOPMENT SITE (74-91)

Category	Existing Conditions	Proposed Development
1	----	----
2	74,87,88,90,91	87,88,90,91
3	79,86,89	86,89
4	75-78,80	74,76-85
5	81-85	75

III. STATIONS FAR FROM THE COMPLEX (92-105)

Category	Existing Conditions	Proposed Development
1	----	----
2	----	----
3	103,105	103, 105
4	95-98,101,102,104	95,97-99,101,102
5	92-94,99,100	92-94,96,100,104

Figure IV-28

Erosion Method (Test 2) vs. Hot-Wire Method (Test 3) for Proposed Development– No International Place and No Trees

Group	Area	Station No.	100-Hr Return Period Peak Gust Velocities (MPH) Erosion (Test 2)	Hot-Wire (Test 3)	Diff.
I Within Development	(1) Along Atlantic Avenue	47	24	29	+5
		49	27	27	0
		51	25	33	+8
		55	31	29	-2
		56	26	28	+2
		58	33	33	0
	(2) Southern Easement	59	29	28	-1
		60	27	29	+2
		61	31	28	-3
		62	32	28	-4
	(4) Northern Promenade	4	#	33	
		6	34	30	-4
		53	30	32	+2
	(5) Rowes Walk	10	34	27	-7
		20	23	23	0
		37	21	24	+3
	(6) North Wharf	2	#	30	
		17	36	30	-6
	(7) Central Wharf	24	31	22	-9
		27	#	28	
		30	31	21	-10
	(8) Ferry Wharf	63	25	25	0
		65	#	27	
		106	##	25	
		107	##	22	
	Average for Group I		25	25	0
II Near Development	(1) Within Atlantic Avenue	85	24	31	+7
	(3) Harbor Towers	88	44**	40*	-4
		91	40*	36	-4
	Average for Group II		36	36	0
III Far From Development	(1) Fort Hill	92	15	25	+10
		97	25	29	+4
		100	20	30	+10
	(2) State Street Bank	102	25	27	+2
	Average for Group III		21	28	+7
	Overall Average		29	29	0

Evaluation Criteria

* Melbourne's limit for acceptable winds 37 mph.

** BRA Guideline 43 mph.

Incorrectly modeled - data not valid - retested by hot-wire method (see Appendix 5, Section III).

Not evaluated.

FIGURE IV-29

Hot-Wire Results for Proposed Development Without International Place (Test 3) vs. With International Place (Test 4) – No Trees

Group	Area	Station	100-Hr Return Period Peak Gust Velocities (MPH) BRA = 43, M = 37 Test 3	Test 4	Diff.
I Within Complex	(1) Along Atlantic Avenue	47	29	30	+1
		49	27	28	+1
		51	33	34	+1
		55	29	29	0
		56	28	28	0
		58	33	32	-1
	(2) Southern Easement	59	28	26	-2
		60	29	27	-2
		61	28	27	-1
		62	28	25	-3
	(4) Northern Promenade	4	33	33	0
		53	32	32	0
	(5) Rowes Walk	10	27	27	0
		37	24	24	0
	(7) Central Wharf	30	21	21	0
	Group Average		29	28	0
II Near Complex	(1) In Atlantic Ave.	85	31	32	+1
	(3) Harbor Towers	88	40*	39*	-1
		91	36	36	0
	Group Average		36	36	0
III From Complex	(1) Fort Hill	92	25	26	+1
		97	29	36	+7
		100	30	31	+1
	(2) State Street Bank	102	27	27	0
	Group Average		28	30	+2

Evaluation Criteria

* Melbourne's limit for acceptable winds 37 mph.

** BRA Guideline 43 mph.

\# Incorrectly modeled - data not valid - retested by hot-wire method (see Appendix 5, Section III).

Figure IV-30

Hot-Wire Results for Proposed Development Without Trees (Test 3) vs. With Tree Configuration I (Test 5)—No International Place

Group	Area	Station	100-Hr Return Period Peak Gust Velocities (MPH) BRA = 43, M = 37 Test 3	Test 4	Diff.
I In Development	(1) Along Atlantic Avenue	51	33	33	0
	(4) Northern Promenade	4	35	32	-1
		6	30	25	-5
		53	32	30	-2
	(5) Rowes Walk	10	27	24	-3
	(5) North Walk	2	30	29	-1
	Group Average		31	29	-2
II Near Development	(4) Harbor Tower	88	40*	41*	+1

Evaluation Criteria:
* Melbourne's limit for acceptable winds.
** BRA's Guideline.

Figure IV-31

Hot-Wire Results for Proposed Development Without Trees (Test 3) vs. Tree Configuration I (Test 6)—No International Place

			100-Hr Return Period Peak Gust Velocities (mph) BRA = 32, M = 37		
Group	Area	Station	No Trees	Trees I	Diff.
I In Development	(1) Along Atlantic Avenue	51	33	32	-1
	(4) Northern Promenade	4	33	32	0
		6	30	24	-6
		53	32	31	-1
	(5) Rowes Walk	10	27	25	-2
	(5) North Wharf	2	30	30	0
	Group Average		31	29	-2
II Near Development	(4) Harbor Tower	88	40*	40*	0

Evaluation Criteria:
* Melbourne's limit for acceptable winds.
** BRA's Guideline.

Shadow

INTRODUCTION

The following shadow analysis is based on computer-generated modeling of the Rowes Wharf Development and its surrounding context. Projected shadows are presented in the accompanying computer drawings. Shadow conditions are presented at four times of the year--at the fall and spring equinox, the summer solstice, and the winter solstice. Morning, noontime, and afternoon conditions are illustrated for each date.

The effects of project shadows are of particular interest in three principal areas: (i) Atlantic Avenue and the Custom House district; (ii) the public plaza areas of the Rowes Wharf project; and (iii) Harbor Towers. Shadow impacts in each of these areas are described below, accordng to the time of year and the impact area.

SUMMARY OF FINDINGS

Spring and Fall Equinox (March 21 and September 21)

Shadow conditions at the spring and fall equinox are identical. The equinox condition shows the average shadow to be expected during the majority of the year. The impacts to be expected are depicted in Figure IV-32 and described below.

Atlantic Avenue/Custom House District. In the spring and fall, Atlantic Avenue will be affected by shadow only in the morning hours. As illustrated, the Custom House District is not affected since shadows will extend only over Atlantic Avenue and the Central Artery, stopping at the Artery's westerly boundary.

Rowes Wharf Public Plaza Areas. At this time of year, shadows will affect the northern promenade and the northern portions of the central and southern wharves through most of the day. Rowes Walk, the ferry terminal, and other public areas will remain in sunshine until mid-afternoon. By mid-afternoon, shadows will cover the rest of the waterside public areas, with the exception of most of the ferry dock, which will remain in sunshine.

Harbor Towers. In the morning hours in late March and late September, shadow from the north wharf building will cover a portion the southernmost area of Harbor Towers. At noon, the north tower of Rowes Wharf will cast a shadow over the pool area. Between noon and three o'clock, the shadows will move to the east and the Harbor Towers site will be virtually unshaded by the Rowes Wharf Development.

Figure IV-32

Spring and Fall Equinox (March 21, 1984) 9:00 AM

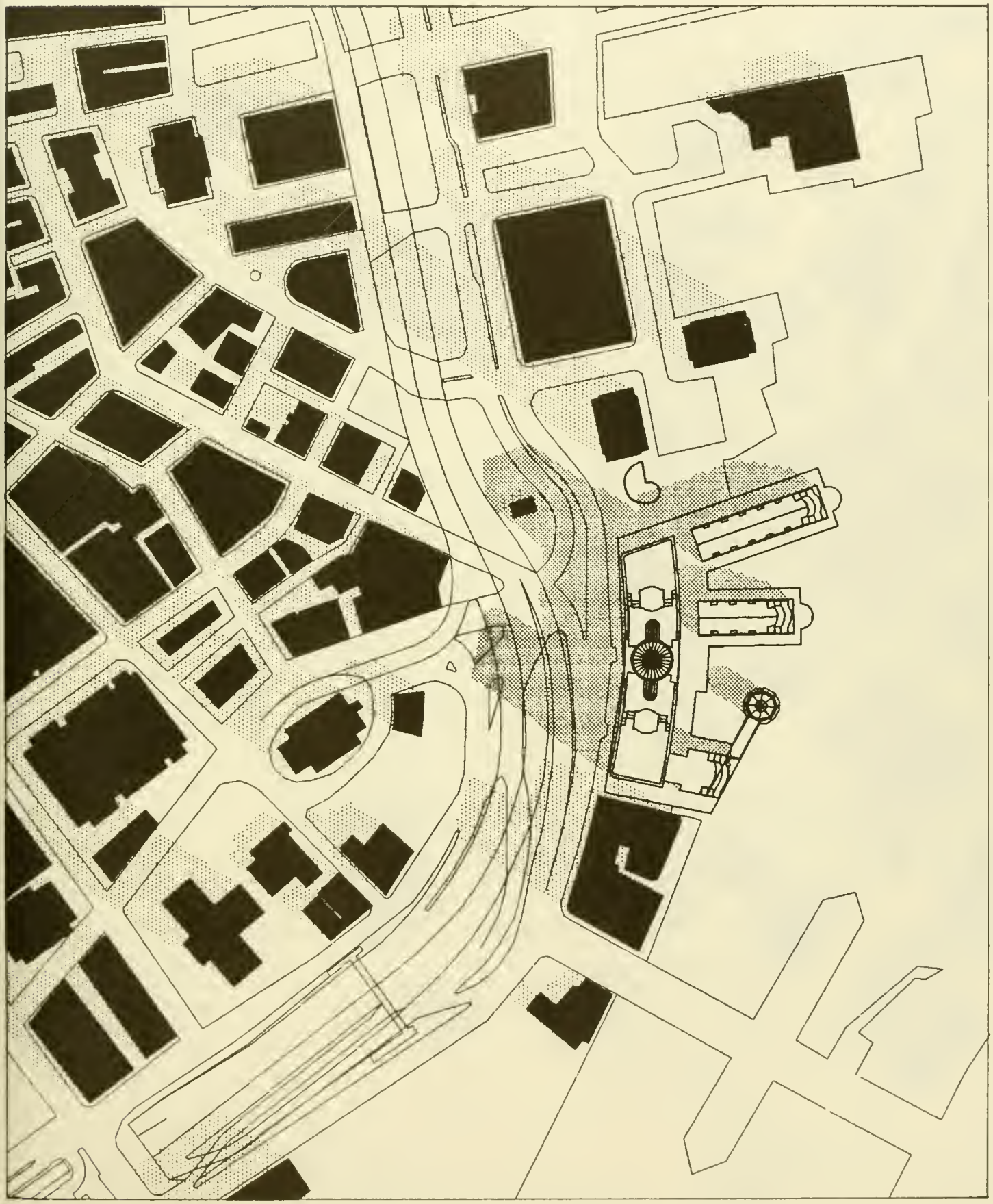


Figure IV-32 (continued)

Spring and Fall Equinox (March 21, 1984)
12:00 Noon

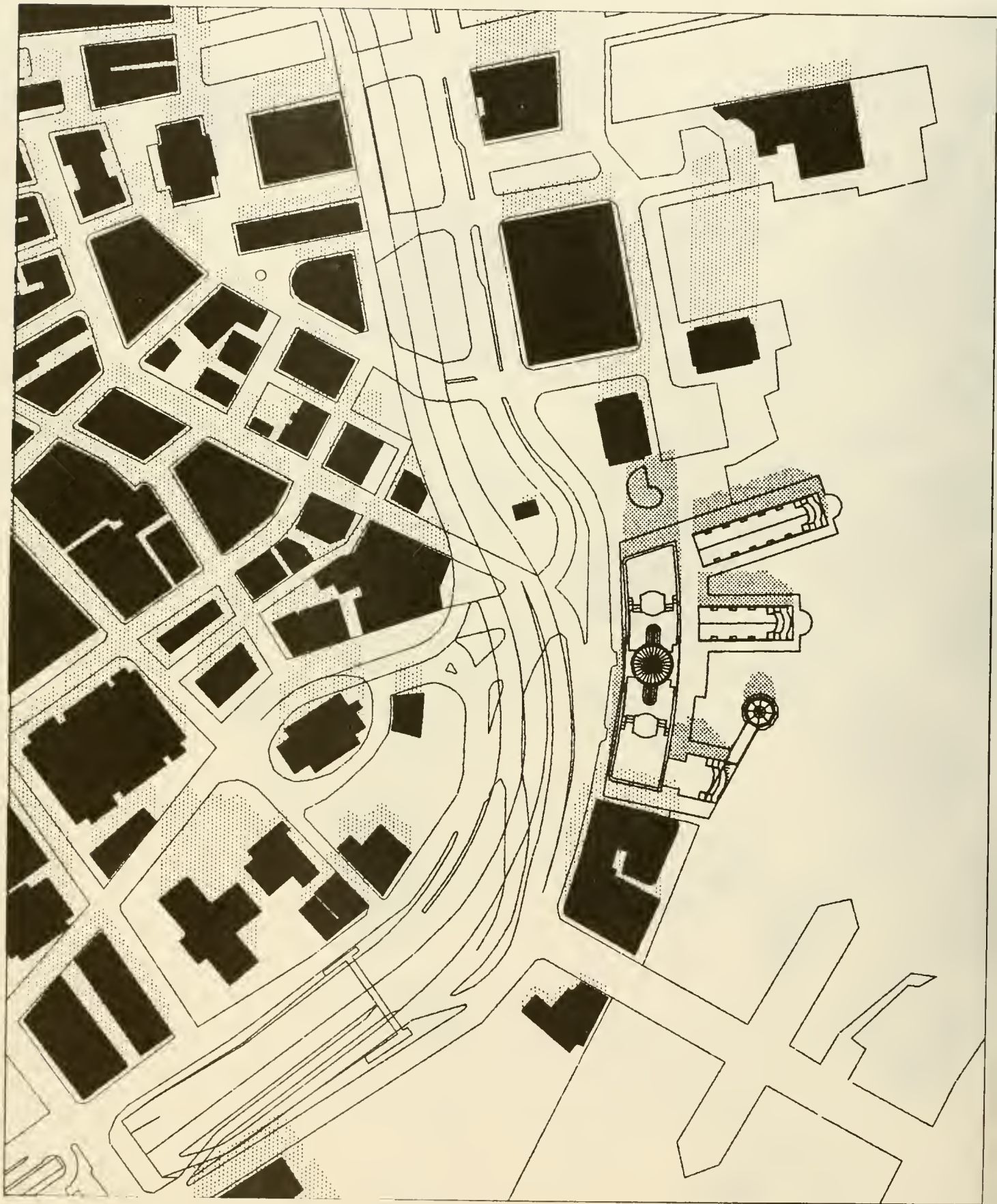
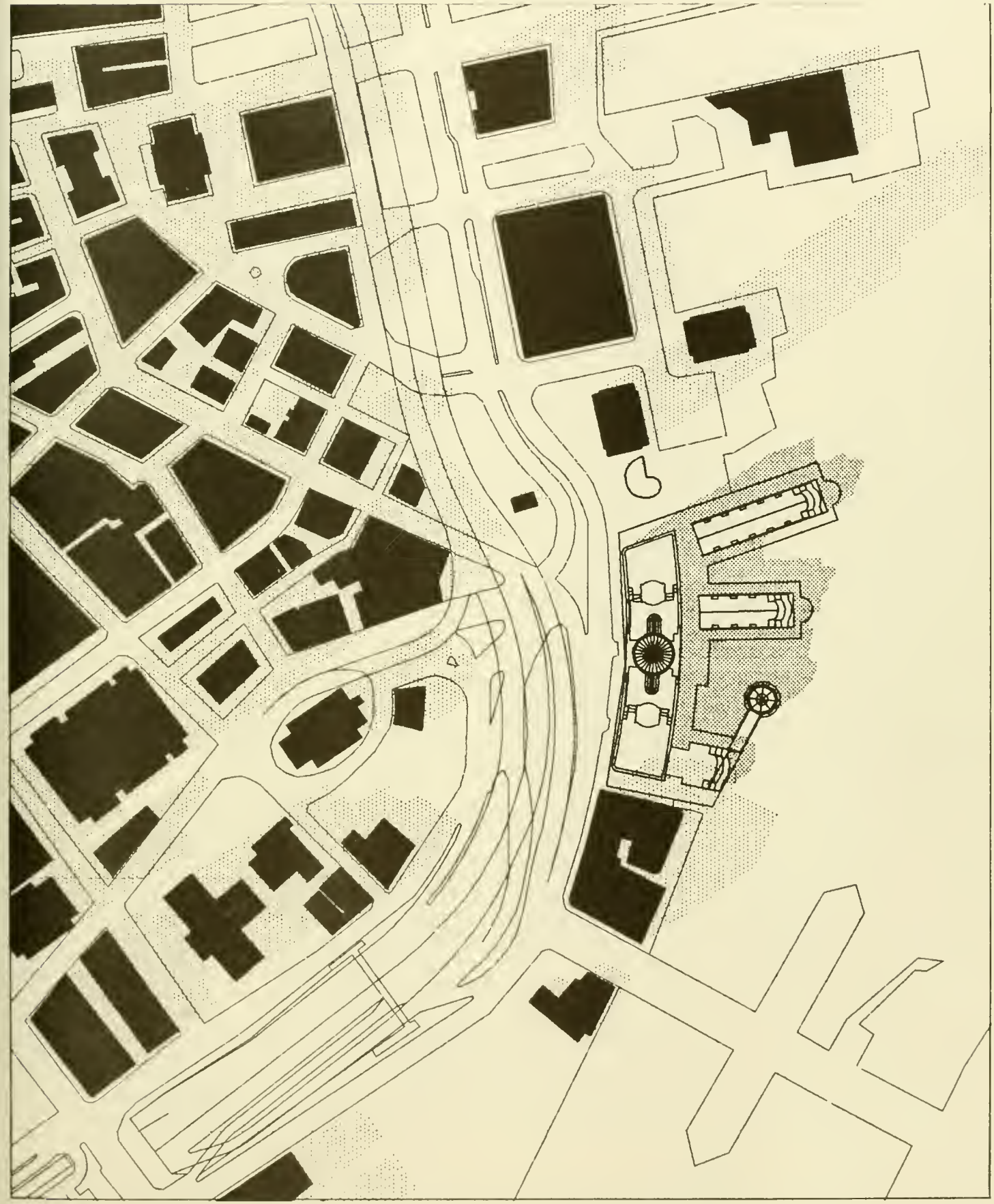


Figure IV-32 (continued)

Spring and Fall Equinox (March 21, 1984) 3:00 PM



Summer Solstice (June 21)

At the summer solstice, the sun is at its highest and the shadows are shorter than at any other time of the year. As shown in Figure IV-33, shadow patterns during this period can be characterized as follows.

Atlantic Avenue/Custom House District. Shadows will extend over Atlantic Avenue and the Central Artery only during the morning hours. The Development will create no shadows in the Custom House District.

Rowes Wharf Public Plaza Areas. Shadow will cover most of the northern promenade in the morning hours, moving off to leave the promenade in full sun by mid-afternoon. The northern section of the central wharf will be in shadow during most of the day, while its southern side will be primarily in sun. Shadows will extend over the northern portion of the south wharf from early afternoon, partially shading the ferryboat dock by mid-afternoon. Rowes Walk will be primarily in the sun up to the mid-afternoon.

Harbor Towers. Except for a small, southwestern segment of the Harbor Towers area, no shadows will be cast on any portion of the site.

Winter Solstice (December 21)

At the winter solstice, the sun is at its lowest in the sky, and shadows are longer than at any other time of the year (see Figure IV-34).

Atlantic Avenue/Custom House District. During the early morning hours, shadows cast by the project will extend over Atlantic Avenue and the Central Artery as far as Custom House Street in the Custom House District. However, at this time of year, the existing buildings in the area already shade all of Broad Street and most adjacent streets. By noon, shadows cast by the project will move off the District and Artery, and by mid-afternoon, Atlantic Avenue will be in full sun.

Rowes Wharf Public Plaza Areas. The majority of the public areas will be shaded in the morning. However, the southeastern portions of the north and central wharves, the ferry terminal, and the southern promenade will be in sunlight. At noon, shadows will fall over

Figure IV-33

Summer Solstice (June 21, 1984)
9:00 AM

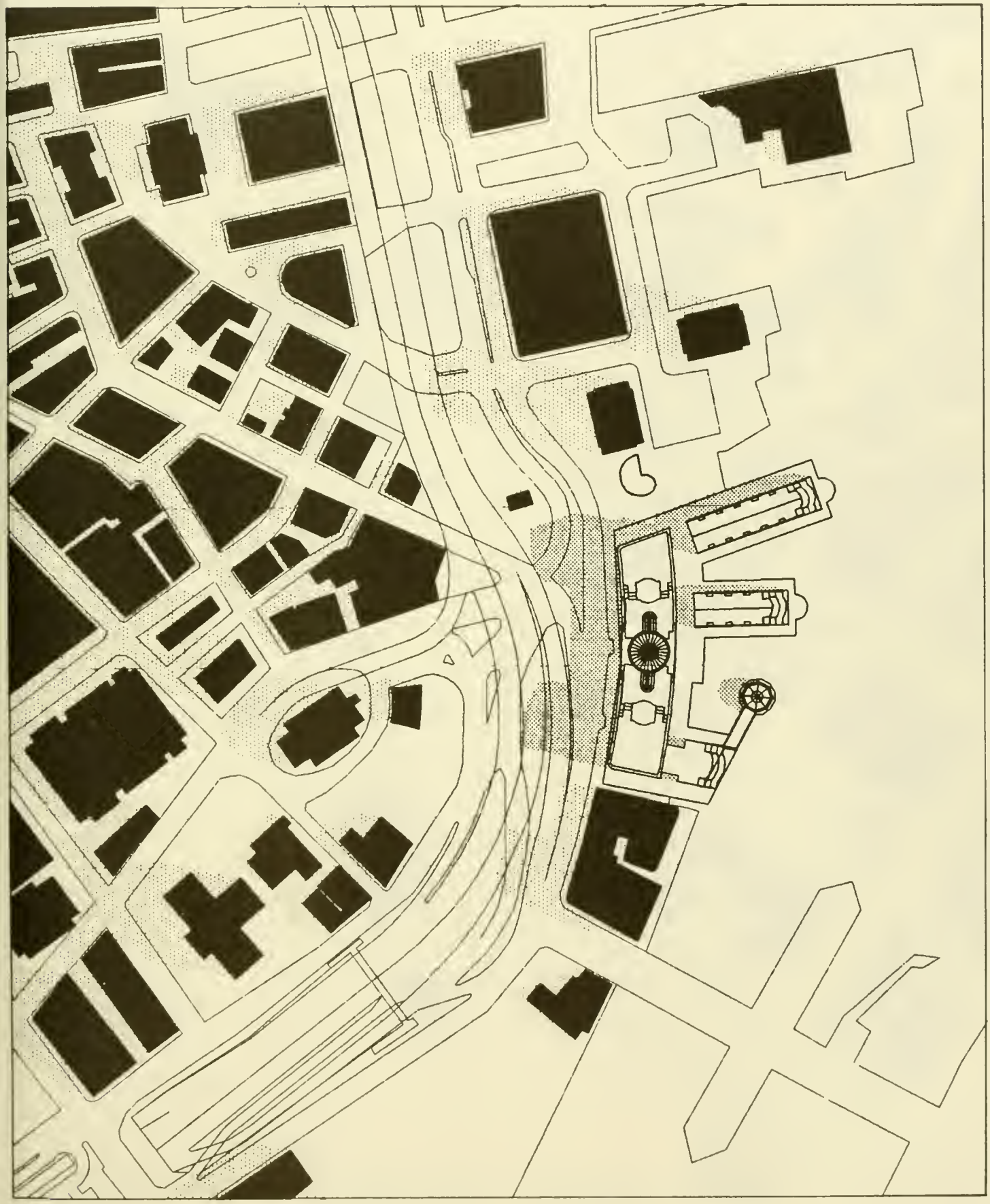


Figure IV-33 (continued)

Summer Solstice (June 21, 1984)
12:00 Noon

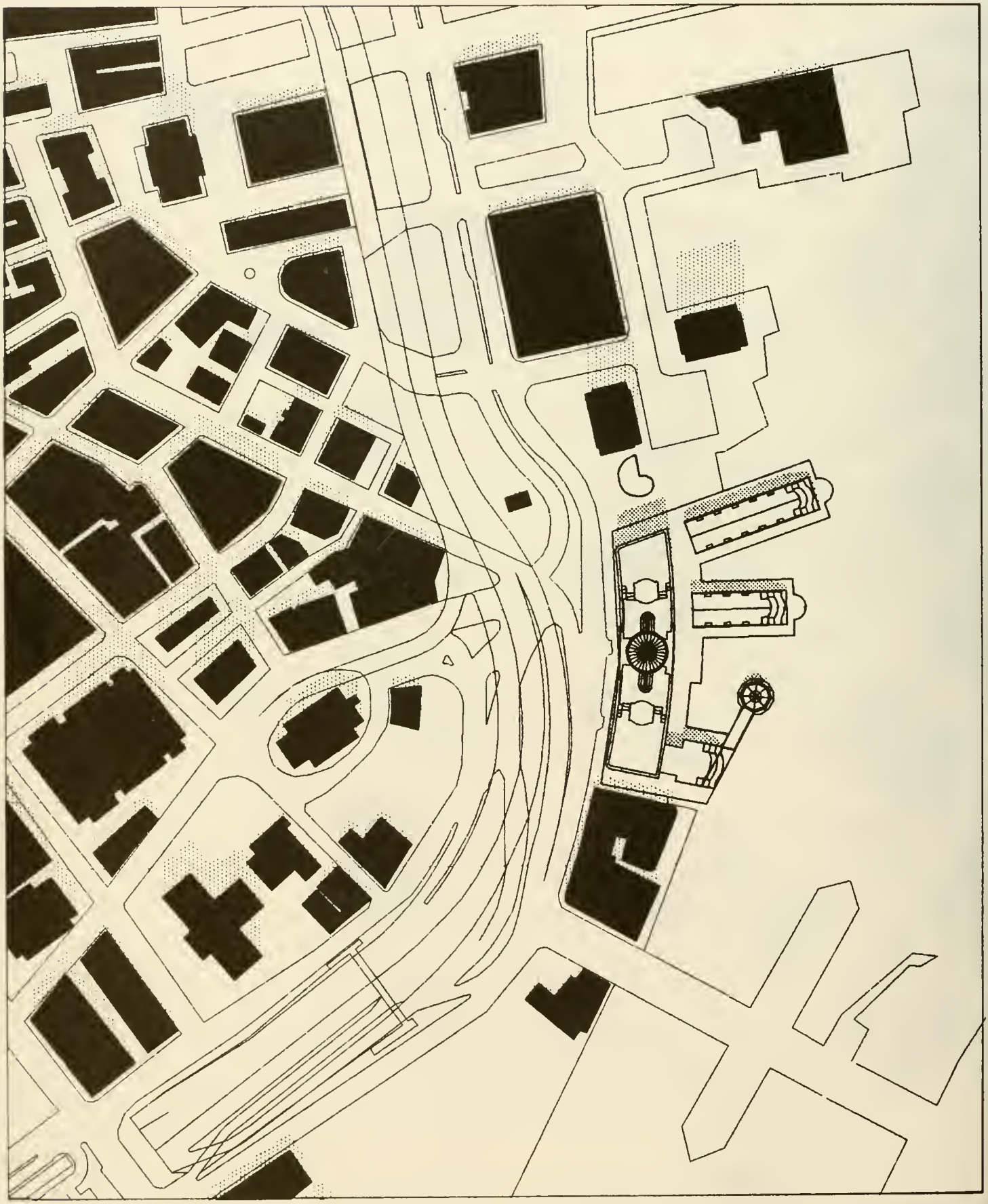


Figure IV-33 (continued)

Summer Solstice (June 21, 1984)
3:00 PM

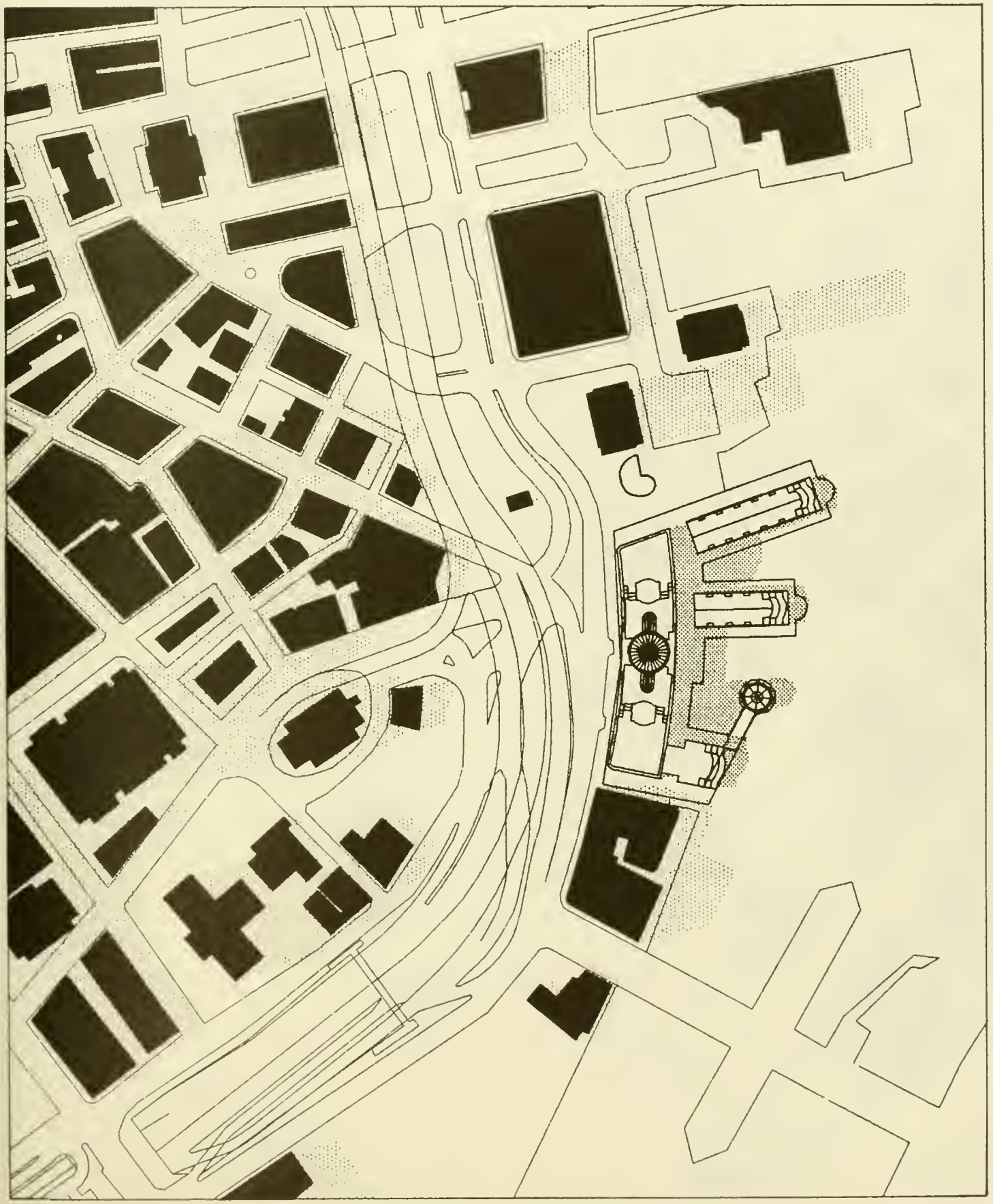


Figure IV-34

Winter Solstice (December 21, 1984)
9:00 AM

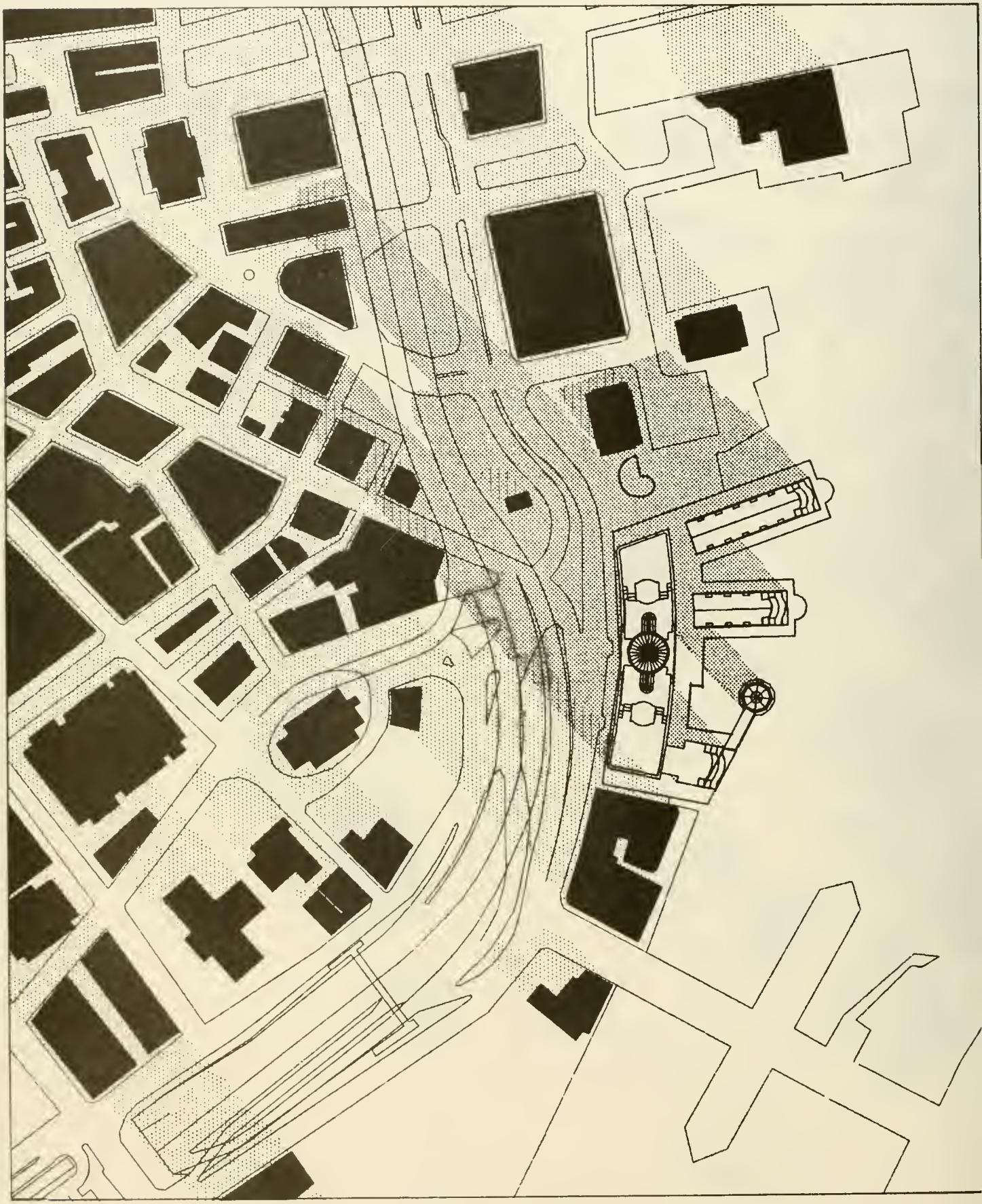


Figure IV-34 (continued)

Winter Solstice (December 21, 1984)
12:00 Noon

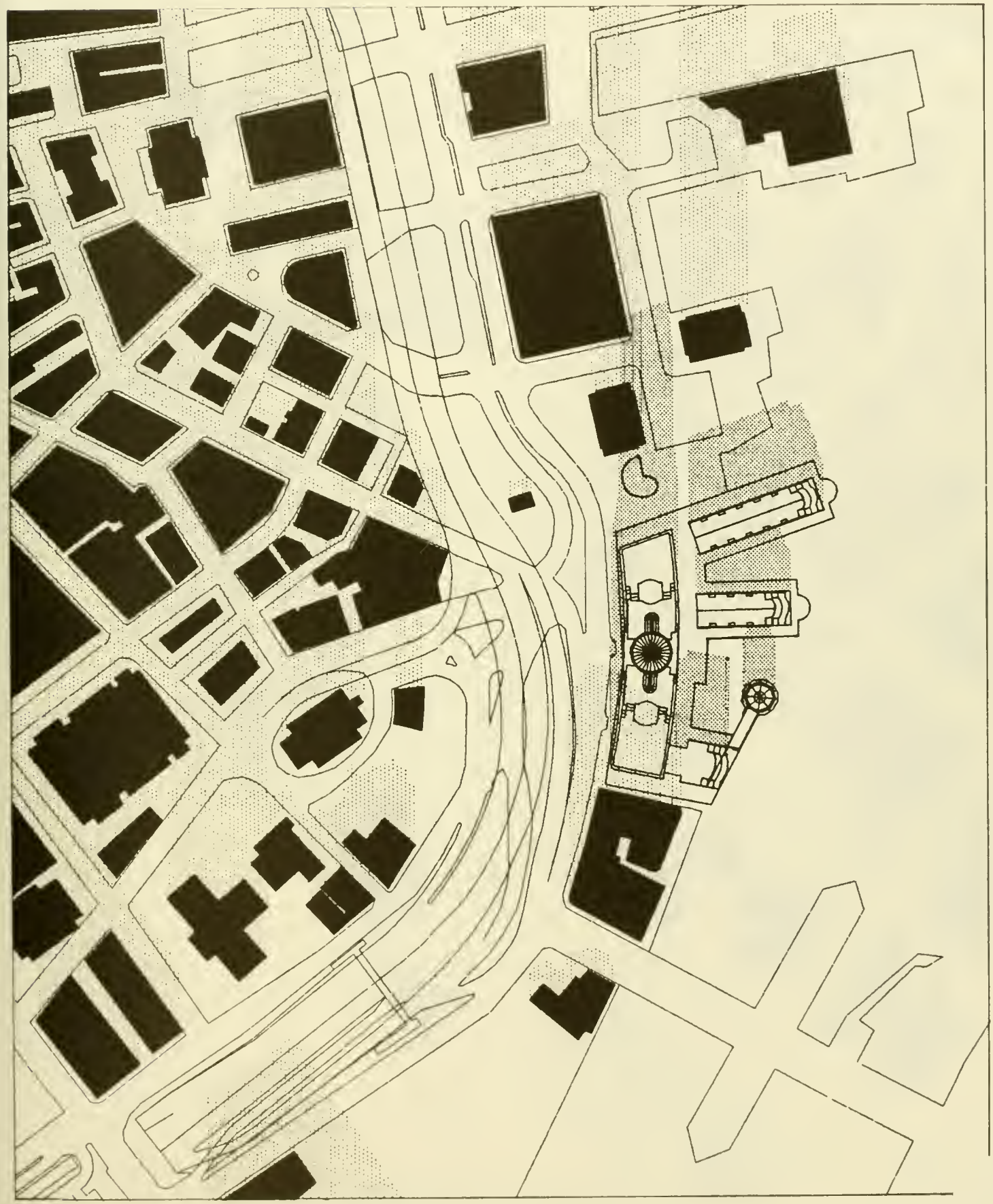
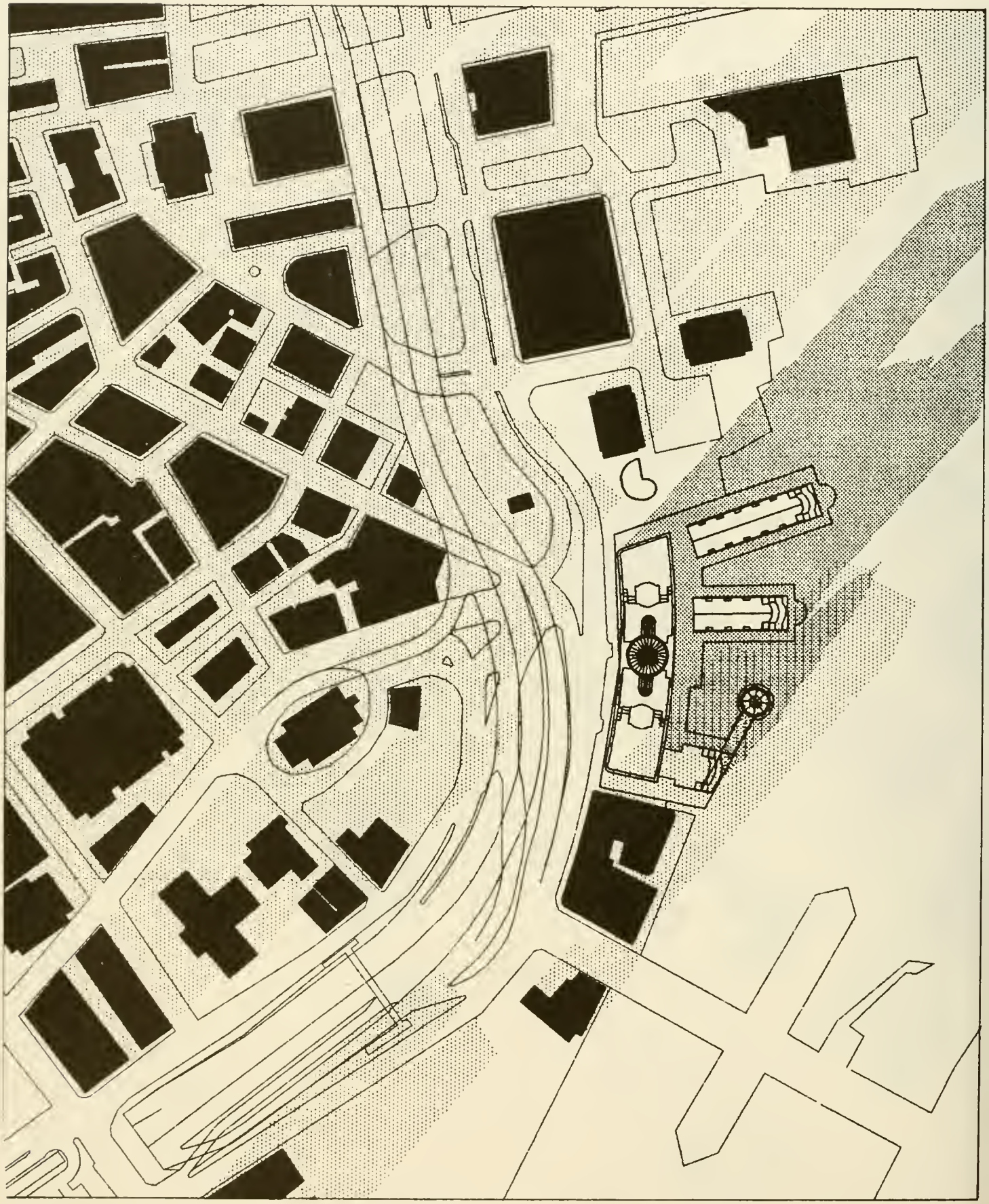


Figure IV-34 (continued)

Winter Solstice (December 21, 1984)
3:00 PM



the majority of the northern promenade, the north portion of the central and south wharves, and the south half of Rowes Walk. By afternoon, all of the public areas will be in shade. However, on December 21, the sun sets at about 4:30 PM and at 3:00 PM, most of the City is in shade.

Harbor Towers. Most of the southern portion of the Harbor Towers land will be in shadow on December mornings. The area in shadow gradually decreases until by mid-afternoon, only the extreme southeastern edge of the property is in shade.

Summary

In general, the following conclusions can be drawn. Atlantic Avenue will be in shade, to a greater or lesser degree, on every morning throughout the year and in sunlight in the afternoon. Shadows will extend as far as the Custom House District only on late fall and early winter mornings. At those times, existing buildings already shade the area in question.

Most of the Rowes Wharf public plaza areas will receive sunlight during some period of the day the majority of the year and particularly in the summer. The exceptions to this will be the northern promenade and portions of the north walkways of the central and south wharves. During the summer, Rowes Walk will be in shade during the hottest period of the afternoon.

The Harbor Towers area will be in full sunlight from the end of May through mid-August, partially shaded during the morning and early afternoon in the spring and fall, and in full shadow in the morning and early afternoon in the winter.

Water Quality, Dredging and Filling

INTRODUCTION

The discussion of water quality, dredging, and filling presented in the Draft EIR has been revised to reflect a refinement of project plans, comments of public interest groups and permitting/review agencies, and to incorporate new analyses of both marine sediment and upland excavation quality. The primary refinement of project plans has to do with the amount and area of dredging, which has been reduced from 18,000 cubic yards (cy) to an estimated 9,000-10,000 cy over a 1.0 acre area. There have also been minor changes in the exact location of the new bulkhead. New figures representing the changes among filled land, decked area, open water, and floating docks have been prepared. The overall discussion of impact and mitigation has been reorganized for improved comprehension, but remains much the same as the Draft EIR.

At the request of several agencies, bioassay and bioaccumulation analyses of the marine sediment have been conducted and the findings are discussed here. Additional analyses of the excavate quality, to include both bulk characteristics and EP toxicity testing, were performed after consultation with the Department of Environmental Quality Engineering (DEQE) on the initial results. These follow-up analyses are also included.

Reanalyses and recalculation of contaminant concentrations in the marine sediment samples and upland excavate materials have shown that actual contaminant levels are lower than originally reported in the Draft EIR. Corrected figures are included.

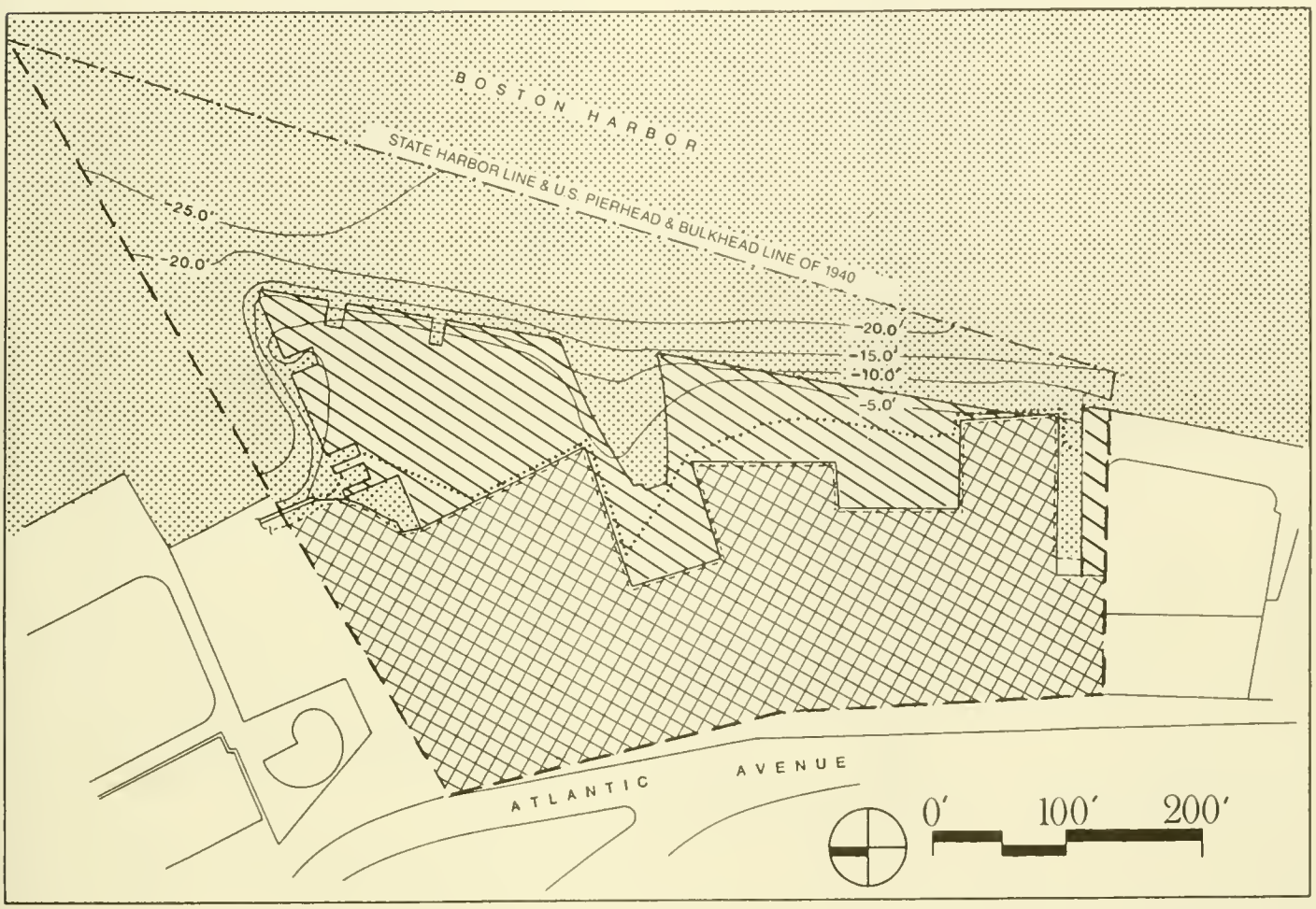
Existing Site Conditions

The Rowes Wharf site, located at the mouth of the Fort Point Channel within Boston Inner Harbor, comprises 3.31 acres of pier and upland filled area and 2.07 acres of open water, as shown in Figure IV-35. A seawall of granite block protects the filled land. Some of the decking is utilized for surface parking. Other areas have been barricaded because of unsafe conditions. All of the decked area is in deteriorated condition.

The average elevation at the top of the decking is +9.2 to +11.2 ft above mean sea level (msl), as compared to the +10.0 ft msl 100-year flood level estimated by the Federal Emergency Management Agency (FEMA).

Figure IV-35

Existing Site Conditions



Deck Area
Filled Land Area
Open Water
Property Boundary
Mean High Water Mark
Mean Low Water Mark
Contour in Feet (mlw)

Water depths in the area of the decking are considerably shallower than adjacent areas. This condition occurs because sediment, stirred by channel boat traffic and ferryboat operations at the site, has settled among the densely spaced piles in the less disturbed, decked area.

Construction and Redevelopment

The proposed plan provides for the complete redevelopment of the Rowes Wharf site. All of the existing wood decking, granite seawalls, and timber pilings will be removed. A new bulkhead will be constructed with steel sheet piling. Most of the existing land area will be excavated for underground parking. Slurry wall construction techniques will be used to define and support the edge of the excavated area. The new wharf structures will be constructed on piles, spaced at intervals of approximately 18 to 24 feet. (See Figure IV-36.)

Four small areas that are presently decked are to be filled, as illustrated in Figure IV-37. These areas comprise 0.22 acres. Approximately 0.24 acres of existing upland are to be excavated below mean low water. Figure IV-38 provides a comparison of filled land, decked area, and open water between existing conditions and the proposed plan.

Figure IV-38

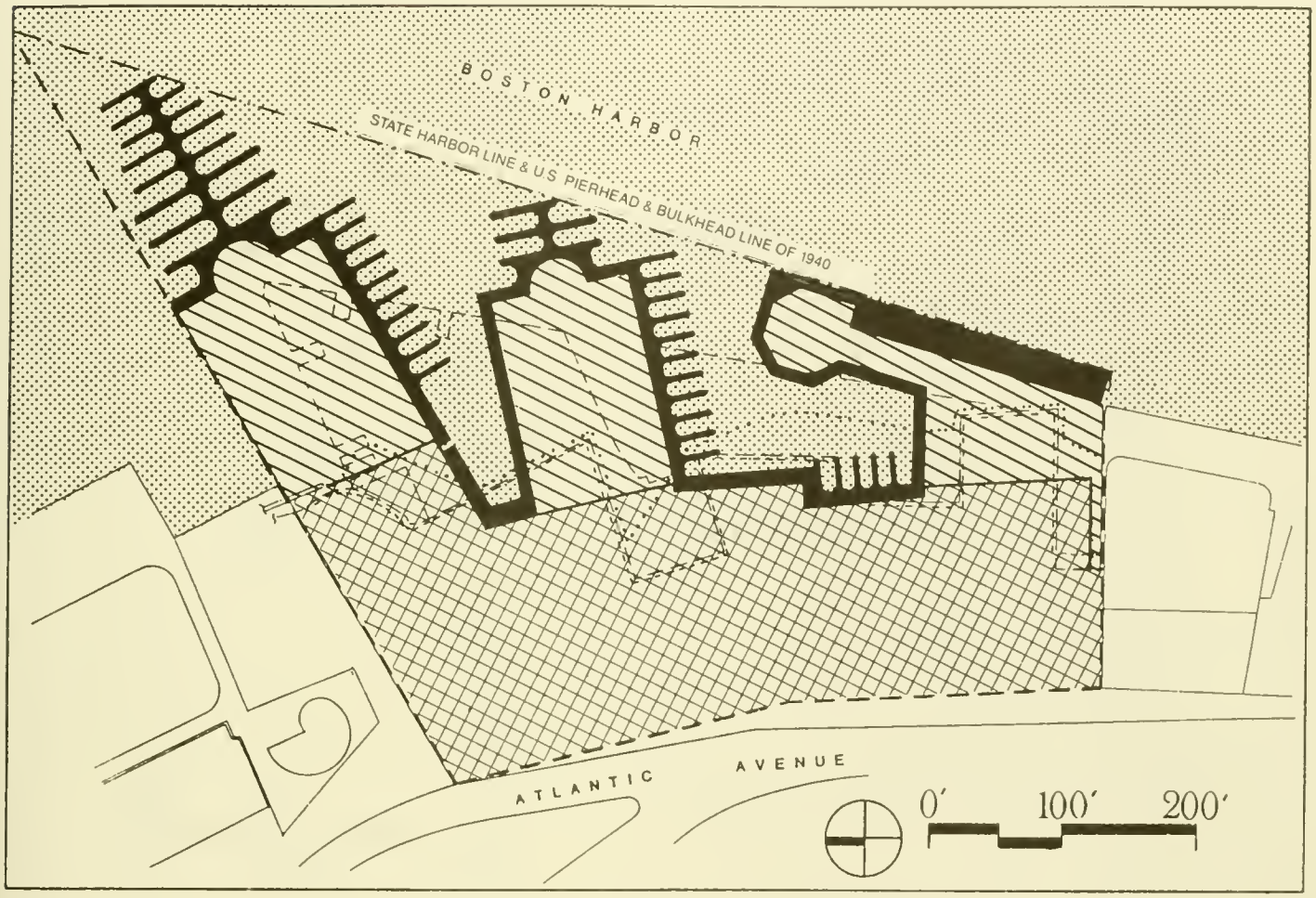
COMPARISON OF FILLED LAND, DECKING, AND OPEN WATER (acres)

	Existing Conditions	Proposed Plan	Difference in Area
Filled Land	2.22	2.19*	-0.03
Decking	1.09	1.23	+0.14
Floating Dock	--	0.54	+0.54
Open Water	2.07	1.42	-0.65
Total	5.38	5.38	--

* "Filled Land" in the proposed plan is primarily the emplacement of structural uses (e.g., parking garage and foundations) where fill or decking is presently located. Only a small portion of the site will be subject to filling with clean granular materials.

Figure IV-36

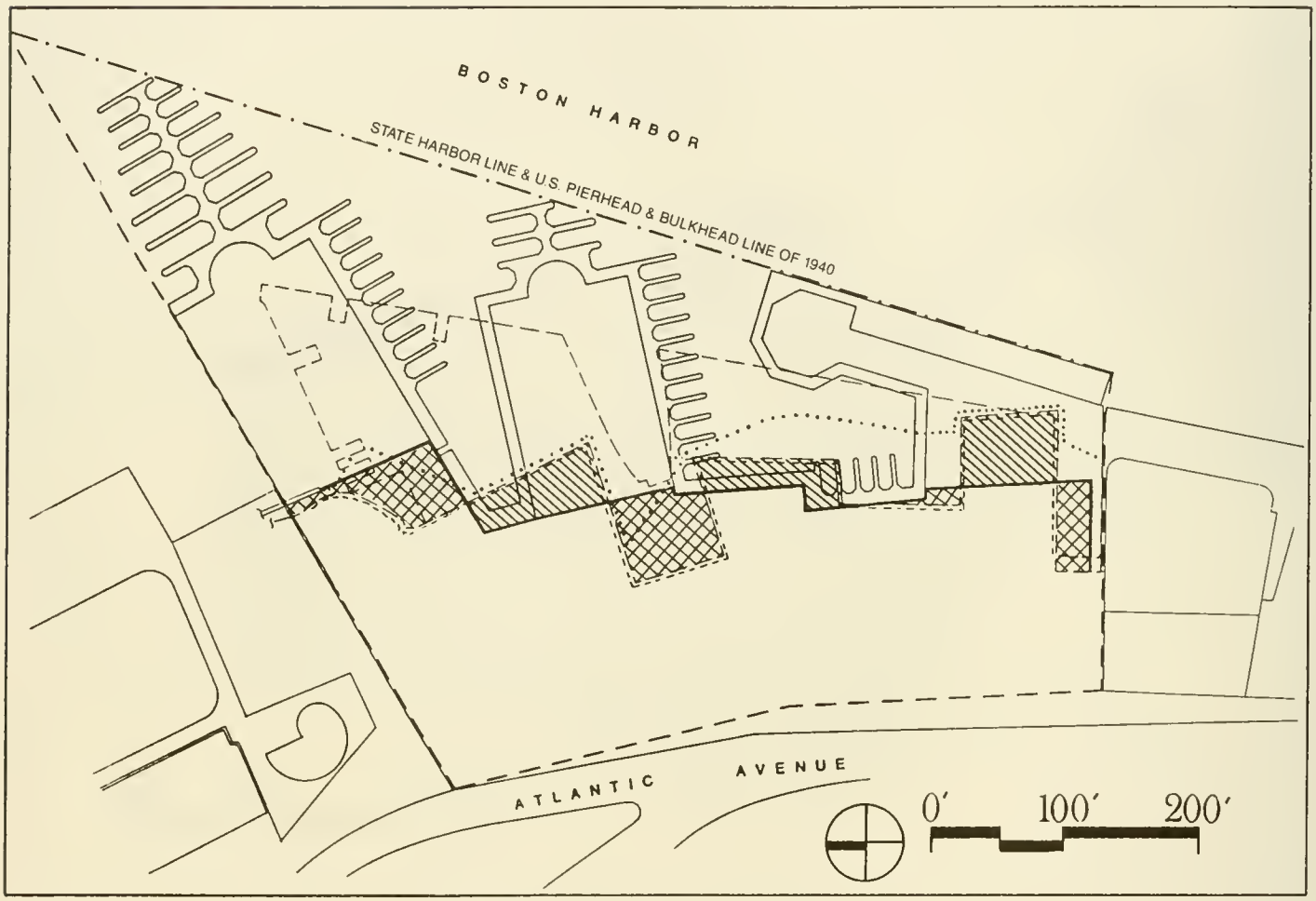
Proposed Site Plan



- Deck Area
- Filled Land Area
- Floating Dock
- Open Water
- Property Boundary
- Existing Deck Area
- Existing Mean High Water Mark
- Existing Mean Low Water Mark
- New Bulkhead Location

Figure IV-37

Areas of Fill & Excavation



Excavated Land Area
Filled Land Area
New Bulkhead Location
Existing Mean High Water Mark
Existing Mean Low Water Mark

The marina will be dredged to a depth of approximately -10 feet mean low water (mlw), and other portions of the site will be dredged for construction access to -7 feet mlw. An estimated total of 9,000-10,000 cy of marine sediments will be removed for disposal.

DESCRIPTION OF THE ENVIRONMENT

Existing Water Quality

Water within Boston Inner Harbor is classified as SC by the Division of Water Pollution Control (DWPC). Such waters are designated as suitable for the protection and propagation of fish and marine life and for secondary contact recreation. Class SC water quality criteria specify dissolved oxygen (DO) levels of no less than 6.0 mg/l; a pH range of 6.5 to 8.5; and no fecal coliform bacteria in excess of a geometric mean of 1,000 organisms per 100 ml.

While no long-term site-specific water quality data exist for the project area, extensive recent water quality data are available from three major sources. These are: (i) water quality and elutriate analyses conducted for several recent Boston Harbor dredging projects; (ii) a DEQE water quality survey conducted in the Harbor in July, 1982 and summarized in Figure IV-39; and (iii) monitoring by Massport during the construction of the Boston Marine Industrial Park.

Permit conditions for filling at the Boston Marine Industrial Park (BMIP) required Massport to conduct a water quality monitoring program at two locations. Location 1 was off the proposed BMIP fill area in South Boston, and Location 2 was off the mouth of the Fort Point Channel near the Rowes Wharf project site.

While overall water quality in the Fort Point Channel area meets the SC standards, violations for many parameters are common. For example, data from Massport (see Figure IV-40) indicate that DO levels are often found below the 6.0 mg/l minimum at both sampling locations, off the end of the Fort Point Channel as well as in the outer reaches of the Inner Harbor. Additionally, the DWPC data indicate contraventions of the water quality criterion for DO at stations located in the Inner Harbor and in the main shipping channel opposite the end of Fort Point Channel.

Figure IV-39

WATER QUALITY SUMMARY BOSTON INNER HARBOR
(mg/l)

Parameter	Maximum	Minimum	Average
pH[1]	8.0	7.6	7.8
Suspended Solids[1]	35.0	16.0	22.0
Oil and Grease[1]	2.6	0.0	1.3
Total Kjeldahl Nitrogen[1]	2.4	0.64	1.23
Ammonia Nitrogen[1]	0.19	0.01	0.07
Sulfate[1]	3,325	1,950	2,488
Total Phosphorus[1]	0.10	0.02	0.05
Conductivity[1] (mhos/cm)	40,000	34,000	38,800
Total Coliform[1] (# organisms/100 ml)	2,400	230	711[3]
Fecal Coliform[1] (# organisms/100 ml)	380	20	105[3]
Chloride[1]	14,000	11,000	13,300
Arsenic[2]	0.001	-	0.001
Cadmium[2]	0.014	0.0005	0.009
Chromium[2]	0.004	-	0.004
Copper[2]	0.01	0.0014	0.006
Lead[2]	0.017	0.002	0.012
Mercury (g/l)[2]	0.05	0.005	0.035
Nickel[2]	0.02	0.004	0.016
Silver[2]	0.08	-	0.08
Vanadium[2]	0.04	-	0.04
Zinc[2]	0.145	0.002	0.05
Dissolved Oxygen[1]			
Surface	8.5	5.2	7.2
Middle (13'-18')	6.8	5.4	5.9
Bottom (26'-40')	6.8	3.4	5.5

Sources:

1/ Massachusetts Department of Environmental Quality Engineering from sampling locations BH03 (Boston Inner Harbor north of mouth of Charles River near U.S. Naval Reserve), BH04 (tidal portion of Charles River downstream of Charlestown Bridge) and BH05 (Main Channel of Boston Inner Harbor near mouth of Fort Point Channel) surveyed July 14-15, 1982, Personal Communication.

2/ U.S. Army Corps of Engineers, 1981, and Massport Seaport Development, 1980.

3/ Geometric mean of DWPC Data.

Figure IV-40

AMBIENT BOSTON HARBOR WATER QUALITY
(Massport: 1982)
November 1980 - November 1981

Sampling Location		Total Suspended Solids (mg/l) X	Total Suspended Solids (mg/l) R	Dissolved Oxygen (mg/l) X	Dissolved Oxygen (mg/l) Min.	PCB (μg/l) X	PCB (μg/l) R
Location 1 (Off South Boston Seaport Development)							
Low Tide	Surface	8.1	0.3-56.2	8.2	4.6	0.65	0.05-1.0
	Mid	10.5	0.3-114.0	8.5	4.9	--	--
	Bottom	18.0	0.3-129.0	8.2	4.8	--	--
High Tide	Surface	10.3	0.3-87.0	9.0	3.4	0.74	0.05-1.0
	Mid	10.3	0.3-59.0	9.5	5.6	--	--
	Bottom	21.2	0.3-136.3	9.2	5.2	--	--
Location 2 (Off Fort Point Channel)							
Low Tide	Surface	8.7	0.3-69.0	8.1	4.1	0.82	0.2-1.0
	Mid	8.4	0.3-65.0	8.1	3.9	--	--
	Bottom	22.7	0.3-169.0	7.6	4.1	--	--
High Tide	Surface	8.1	0.3-60.0	8.4	4.5	0.54	0.05-1.0
	Mid	11.6	0.3-86.0	9.0	5.3	--	--
	Bottom	18.8	0.3-145.9	8.3	4.9	--	--

X = Mean
R = Range

Average concentrations of soluble metals in the Inner Harbor are generally within acceptable ranges. Total suspended solids are highly variable, as indicated by the Massport data, and are typically a function of storm conditions.

Numerous combined sewer overflows (CSOs) and raw sewage discharges are found in Boston Harbor. Wet weather and dry weather flows from these sewers contain considerable concentrations of sediments, metals, bacteria, and substantial oxygen demand. The CSO locations closest to Rowes Wharf are located at the New England Aquarium (approximately 800 feet north of the site) and at Northern Avenue (approximately 400 feet south of the site).

Existing Sediment Quality

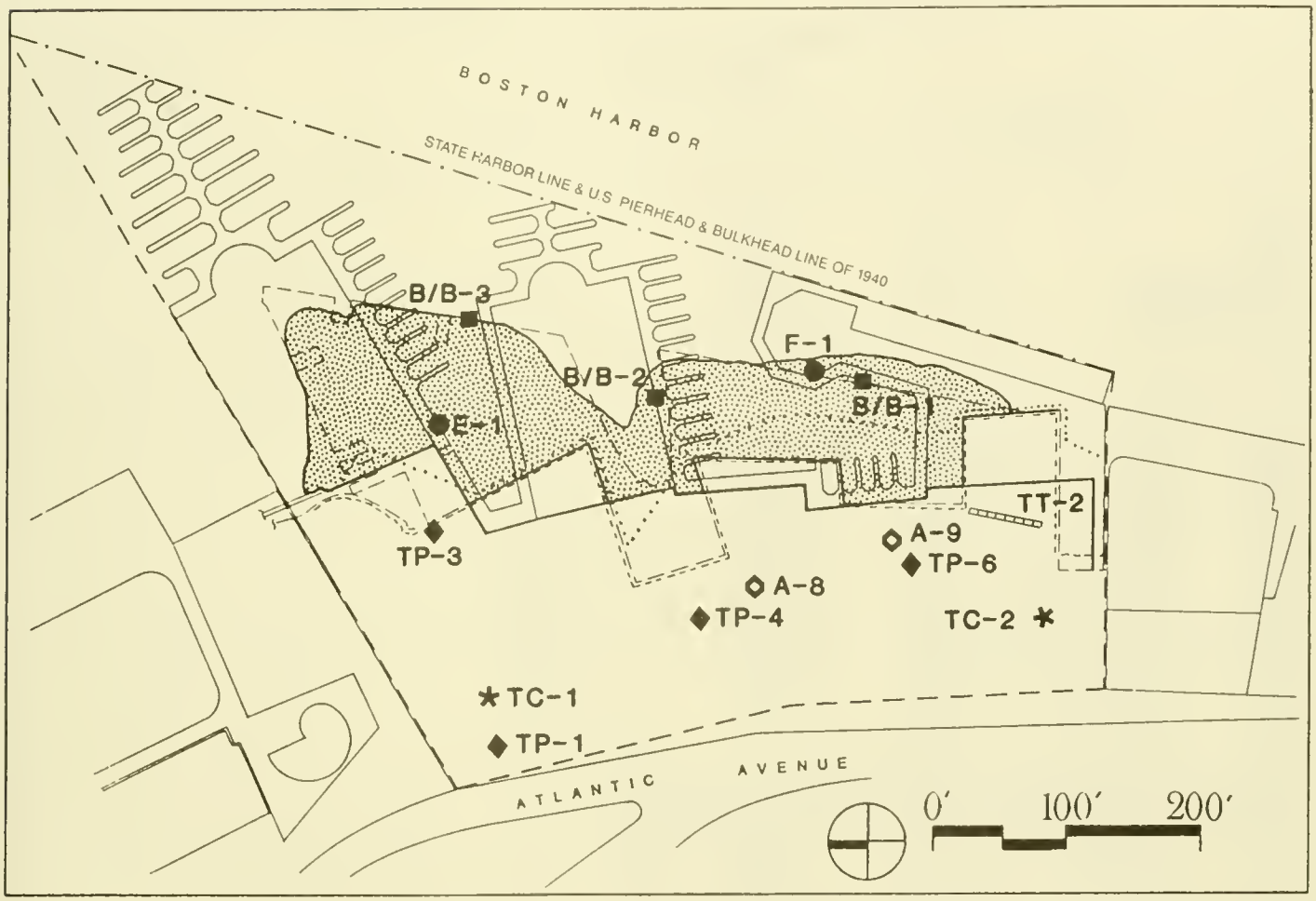
In order to characterize sediment quality in the project area, two cores were collected at locations E-1 and F-1 shown in Figure IV-41 and analyzed for bulk sediment quality, as shown in Figure IV-42. These results may be compared with the state criteria for the chemical and physical classifications of sediments, shown in Figure IV-43. Sediment core logs are presented in Figure IV-44.

The results of the analyses show that cadmium, mercury, and zinc are found at Category 3 concentrations at or near the surface of one of the sample locations. The remainder of the metals detected are either Category 1 or 2 concentrations. Based on a grain size analysis and the percent oil and grease, the sediments would be classified as Type C. The core logs and the chemical and physical analyses indicate that the sediment at the surface is somewhat more contaminated than that found between 20 and 44 inches. Naturally-occurring silt, sand, and/or clay are generally encountered within 5 and 10 feet of the surface (depending on location and depth of colonial fill). This naturally-occurring material was not analyzed. However, based upon the results from numerous other Inner Harbor projects, it can be expected to be uncontaminated, Category 1 material.

Based upon the contaminant concentrations indicated by the bulk analysis conducted on the marine sediments, bioassay and bioaccumulation tests were also completed, as requested by several permitting/review agencies.

Figure IV-41

Upland & Marine Sample Locations



	Dredged Area
●E-1, F-1	Marine Sediment Locations
■ B/B-1,2,3	Bioassay/Bioaccumulation Composite Locations
◇A-8,9	Excavate Boring Locations
◆TP-1,3,4,6	Test Pit Locations
✱TC-1,2	Test Caisson Location
TT-2	Test Trench Location
----	Existing Mean High Water Mark
....	Existing Mean Low Water Mark

Figure IV-42

Bulk Characteristics—Marine Sediment

WATER QUALITY LABORATORY
ANALYSIS REPORT

PROJECT: ROWES WHARF
PROJ/NO: 148 BLK-MARINE SED

244 SECOND AVENUE
WALTHAM, MA 02154
617/890-3737

STATION:		E-1		E-1		F-1	
DATE:		1/17/84		1/17/84		1/17/84	
SAMPLE#:		7349B		7350B		7351B	
TYPE OF ANALYSIS:		BULK		BULK		BULK	
SEDIMENT DEPTH:		0-12"		20-44"		0-18"	
		CONC	CLASS	CONC	CLASS	CONC	CLASS
ARSENIC	mg/kg dry wt.	14.81	2	9.39	1	7.86	1
CADMIUM	mg/kg dry wt.	29.63	3	18.72	3	35.06	3
CHROMIUM	mg/kg dry wt.	10.43	1	6.82	1	9.25	1
COPPER	mg/kg dry wt.	378.97	2	185.12	1	395.89	2
LEAD	mg/kg dry wt.	79.32	1	48.98	1	93.08	1
MERCURY	mg/kg dry wt.	1.67	3	1.30	2	1.35	2
NICKEL	mg/kg dry wt.	70.90	2	48.13	1	66.50	2
VANADIUM	mg/kg dry wt.	45.05	1	24.06	1	36.99	1
ZINC	mg/kg dry wt.	401.32	3	213.2	2	381.12	2
PCB	mg/kg dry wt.	(0.005	1	---	1	(0.005	1
DDT*	mg/kg dry wt.	(0.005	N/A	---	N/A	(0.005	N/A
P/TOTAL	mg/kg dry wt.	486.70	N/A	380.80	N/A	317.20	N/A
N/AMMONIA	mg/kg dry wt.	76.34	N/A	85	N/A	78.44	N/A
PHENOLS	mg/kg dry wt.	7.57	N/A	3.05	N/A	4.78	N/A
TKN	mg/kg dry wt.	2473.5	N/A	2308.2	N/A	1778.6	N/A
SOLIDS/T	%	29.37	N/A	51.53	N/A	42.18	N/A
SOLIDS/V	%	18.07	3	8.26	2	18.44	3
O&G	%	.43	1	3.62	3	1.17	3
SILT/CLAY	%	89	2	88	2	50	1
WATER CNT	%	70.63	3	48.47	2	57.82	2

*INCLUDING DDT, DDD, DDE, AND ELDRIN
ALL CONCENTRATIONS EXPRESSED ON DRY WEIGHT BASIS

2/19/84
CARLTON L. NOYES

Figure IV-43

MASSACHUSETTS CRITERIA FOR
CLASSIFICATION OF DREDGE OR FILL MATERIAL
BY CHEMICAL CONSTITUENTS
(ppm)

Parameter	Category One	Category Two	Category Three
Arsenic (As)	10	10-20	20
Cadmium (Cd)	5	5-10	10
Chromium (Cr)	100	100-300	300
Copper (Cu)	200	200-400	400
Lead (Pb)	100	100-200	200
Mercury (Hg)	0.5	0.5-1.5	1.5
Nickel (Ni)	50	50-100	100
Polychlorinated Biphenyls (PCBs)	0.5	0.5-1.0	1.0
Vanadium (V)	75	75-125	125
Zinc (Zn)	200	200-400	400

MASSACHUSETTS CRITERIA FOR
CLASSIFICATION OF DREDGE OR FILL MATERIAL
BY PHYSICAL CHARACTERISTICS

Parameter	Type A	Type B	Type C
Percent silt-clay	60	60-90	90
Percent water	40	40-60	60
Percent volatile solids (NED method)	5	5-10	10
Percent oil and grease (hexane extract)	0.5	0.5-1.0	1.0

Source: 314 CMR 9.03

Figure IV-44

SEDIMENT CORE LOGS

Core E-1	Collected: Total length 3.7 ft.
0.0 - 1.0 ft	Black oily muck with high water content. Wood fragment at 0.7 ft.
1.0 - 1.7 ft	Black oily muck. Some organics. Whole mussel shell at 1.3 ft.
1.7 - 2.8 ft	Greenish black silty muck. Log deposit of shell fragments at 1.7 to 1.8 ft. Some shell fragments throughout section. Core firming downward into coarser material.
2.8 - 3.7 ft	Firm, greenish black sandy silts. Shell fragments. Wood fragment at 3.3 ft.
Core F-1	Collected: Total length 1.9 ft.
0.0 - 1.5 ft	Black oily muck with some silts and sand. Several pebbles. Light bulb base at 0.7 ft. Wood fragment (board) at 0.9 ft.
1.5 - 1.9 ft	Greenish grey, very firm marine clay. Varved organic layers in clay.

The purpose of these tests was to evaluate the potential impact of dredged material disposal on marine benthic and pelagic communities at the disposal site, and thus to determine the suitability of sediments for ocean disposal at the Massachusetts Bay Foul Area.

The test organisms used were the grass shrimp (Palaeomonetes pugio), the quahog (Mercenaria mercenaria), and the clam worm (Nereis virens). Acute toxicity and bioaccumulation of PCBs, DDT, petroleum hydrocarbons, mercury, and cadmium were analyzed by comparison of sediments from the Rowes Wharf site (at locations B/B-1,2,3 shown in Figure IV-41) with reference sediments from the proposed disposal site.

Toxicological evaluations conducted as part of the study show that the sediments from the project area were not acutely toxic to the species tested. Analysis of the data set showed no significant change in survival for animals exposed to the Rowes Wharf sediments compared to those exposed to sediments at the proposed disposal site, the Massachusetts Bay Foul Area.

Evaluation of test body burdens of selected parameters (mercury, cadmium, DDT, and aromatic petroleum hydrocarbons) showed either no accumulation or no significant difference in a comparison between animals exposed to the Rowes Wharf sediments and disposal site sediments. Data on PCB burdens showed no accumulation in Palaeomonetes and no significant difference in body burdens for Nereis on a treatment versus reference site comparison. A significant difference in body burdens was reported for Mercenaria, the higher levels being noted for the Rowes Wharf sediments as compared to the disposal site samples. This finding, however, is the result of analytical procedures allowing PCB detection well below the required 0.04 mg/kg detection limit in Mercenaria exposed to sediments from both the reference and project sites. At the required detection limit of 0.04 mg/kg, there was no significant accumulation of PCB in any test organism, thus no significant environmental impacts can be anticipated.

Based on these results, the sediments from the proposed Rowes Wharf Development project are suitable for disposal at the Massachusetts Bay Foul Area (Boston Foul Area) and should have no observable long-term impact. A detailed report of the bioassay and bioaccumulation results is attached as Appendix 7.

Existing Upland Materials Quality

Approximately 125,000-150,000 cy of upland materials will be excavated, most of it to accommodate below-grade parking. The materials to be excavated consist of fill placed over the harbor clays during the 1800s, the clay itself, and at depth, some glacial till. Because the Ocean Dumping Permit for the Massachusetts Bay Foul Area authorizes disposal only of marine sediments that have been dredged from waters of the United States, these upland materials, including the buried marine sediments, must be disposed of on land.

DEQE, Office of Solid Waste, reviews proposals to dispose of excavated materials at landfills or other areas, with the ultimate disposal site determined based on the chemical nature of the materials. For those excavated materials whose bulk chloride content is less than 250 mg/kg, disposal at inland areas would likely be permitted by DEQE, providing the materials are not significantly contaminated with metals or organic compounds. For materials whose bulk chloride concentrations are above 250 mg/kg, disposal at coastal areas that drain directly to a marine environment is necessary.

Initially, two samples from the site (locations A-8, 9 as shown on Figure IV-41) were tested for bulk chloride, metals, organic compounds, nutrients, and several other parameters. Figure IV-45 presents the results.

Subsequently, three test pits were excavated and materials from three depths (0-2 ft, 4-6 ft, and 8-10 ft) were analyzed. (See sample locations TP 1,4,6 as shown on Figure IV-41). Samples were also taken at two other locations, Test Caisson 2 at 10 ft and Test Trench 2 at 6 ft. The results of all eleven excavate analyses are included in Figure IV-46. Some elevated metal concentrations, particularly arsenic, copper, lead, and zinc, were found. It should be noted that the highest copper and zinc levels were found at depths where old copper tubing and Romex cable were among the fill. Past industrial activities on the site, including ship chandlers and other maritime activities, machining, printing, and electroplating, are also believed to have contributed to the metallics in the fill. No volatile organic compounds, PCBs, or pesticides have been found.

Figure IV-45

Bulk Characteristics of Excavate Material—Initial Sampling

WATER QUALITY LABORATORY
ANALYSIS REPORT

PROJECT: ROWES WHARF
PROJ/NO: 148 BLK-EXCAVATE

244 SECOND AVENUE
WALTHAM, MA 02154
617/890-3737

STATION:		A-8		A-9A	
DATE:		2/8/84		2/8/84	
SAMPLE#:		7355B		7356B	
TYPE OF ANALYSIS:		BULK		BULK	
SEDIMENT DEPTH:		18-19.5'		0-21'	
		CONC	CLASS	CONC	CLASS
CHLORIDE	mg/kg dry wt.	8000	N/A	9360	N/A
ARSENIC	mg/kg dry wt.	1.99	1	2.60	1
CADMIUM	mg/kg dry wt.	6.95	2	9.17	2
CHROMIUM	mg/kg dry wt.	7.83	1	9.58	1
COPPER	mg/kg dry wt.	19.47	1	317.97	2
LEAD	mg/kg dry wt.	5.60	1	32.75	1
MERCURY	mg/kg dry wt.	0.04	1	0.22	1
NICKEL	mg/kg dry wt.	17.91	1	29.61	1
VANADIUM	mg/kg dry wt.	26.68	1	24.63	1
ZINC	mg/kg dry wt.	49.35	1	104.61	1
PCB	mg/kg dry wt.	.005	1	.005	1
DDT*	mg/kg dry wt.	.005	N/A	.005	N/A
P/TOTAL	mg/kg dry wt.	50.73	N/A	29.29	N/A
N/AMMONIA	mg/kg dry wt.	11.45	N/A	3.37	N/A
PHENOLS	mg/kg dry wt.	0.07	N/A	0.06	N/A
TKN	mg/kg dry wt.	68.50	N/A	26.62	N/A
COD	mg/kg dry wt.	62,726	N/A	38,649	N/A
SOLIDS/T	%	71.43	N/A	75.07	N/A
SOLIDS/V	%	4.13	1	6.94	2
O&G	%	.32	1	.28	1
SILT/CLAY	%	62	2	23	1
WATER CNT	%	28.57	1	24.93	1

*INCLUDING DDT, DDD, DDE, AND ELDRIN
ALL CONCENTRATIONS EXPRESSED ON DRY WEIGHT BASIS

7/17/84

CARLTON L. NOYES

Figure IV-46

Detailed Excavate Analysis Program Results

WATER QUALITY LABORATORY
ANALYSIS REPORT

PROJECT: ROWES WHARF
PROJ/NO: 148 BULK

244 SECOND AVENUE
WALTHAM, MA 02154
617/890-3737

STATION:		TP1	TP1	TP1	TP4	TP4	TP4	TP6	TP6	TP6	TC3	TT2
DATE OF ANALYSIS:		6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84	6/6/84
SAMPLE #:		7402	7403	7404	7405	7406	7407	7408	7409	7410	7411	7412
TYPE OF ANALYSIS:		BULK	BULK	BULK	BULK	BULK	BULK	BULK	BULK	BULK	BULK	BULK
SAMPLE DEPTH:		0-2'	4-6'	8-10'	0-2'	4-6'	8-10'	0-2'	4-6'	8-10'	10'	6'
ARSENIC	mg/kg	13.16	8.71	24.39	17.50	8.90	12.60	12.30	17.20	11.30	13.35	20.50
CADMIUM	mg/kg	.73	1.76	.47	.83	2.90	1.30	.26	.40	1.00	1.10	.60
CHROMIUM	mg/kg	5.15	5.80	6.52	4.97	32.00	26.30	5.32	3.60	7.50	6.10	5.70
CHLORIDE	mg/kg	1,505	1,187	1,598	1,557	1,251	1,809	1,310	1,428	1,378	1,815	1,728
COPPER	mg/kg	31.40	355.60	39.30	26.20	32.40	34.60	26.30	316.20	233.90	24.00	87.90
LEAD	mg/kg	16.40	23.30	18.00	19.90	312.80	1355.30	366.60	759.60	150.40	10.00	6.40
MERCURY	mg/kg	.10	1.09	.24	.11	.34	.38	.20	.04	.04	.04	.50
NICKEL	mg/kg	18.53	22.60	23.40	13.40	14.90	11.10	13.20	12.40	6.20	14.90	26.50
VANADIUM	mg/kg	23.90	17.40	35.40	27.60	27.30	29.50	16.90	15.90	10.80	17.10	18.90
ZINC	mg/kg	63.90	138.90	58.80	106.70	47.00	152.20	75.30	70.50	36.40	54.40	81.60
O&G	%	.14	.19	.18	.07	.07	.25	.07	.08	.27	.12	.20
SOLIDS/T	%	91.69	79.21	79.45	90.53	86.30	84.55	86.25	74.94	67.49	84.84	83.69
SOLIDS/V	%	1.75	3.06	3.97	2.39	3.25	3.19	4.33	16.69	13.35	1.62	3.98

Carl L. Noyes 7/19/84

CARLTON L. NOYES

EP Toxicity analyses were conducted on samples from these test locations to determine whether the fill should be treated as hazardous. These tests were negative, all metals being well below the threshold indicated in the Environmental Protection Agency regulations. Results of the EP toxicity tests are presented in more detail in Appendix 7.

As part of the detailed sampling program, additional bulk chloride analyses were conducted. Test caissons, TC-1 and TC-2, were placed at the locations shown on Figure IV-41. Bulk chloride concentrations were measured at intervals throughout the depth of the caissons. Figure IV-47 indicates the depth of sample and corresponding chloride concentration in each caisson location. Throughout the depth of each caisson, chloride concentrations remained well above the 250 mg/kg limit for disposal at inland sites, although concentrations decrease gradually with depth. Because the materials have been found to contain bulk chloride at concentrations significantly above 250 mg/kg, disposal at a coastal landfill or disposal site will be required.

FIGURE IV-47

Bulk Chloride Concentrations with Depth
(mg/kg dry weight)

Test Caisson 1		Test Caisson 2	
Depth (ft)	Concentration	Depth (ft)	Concentration
23	2401	27	2855
32	2187	39	7278
38	2231	46	3650
44	827	51	2249
49	884	59	2197
54	1105	67	1913
61	337		
71	283		

PROBABLE PROJECT IMPACTS

Water Quality Impacts

Water quality impacts may result from the following construction activities: (i) demolition and removal of existing seawalls, timber deck, and piles; (ii) installation of new bulkhead and piles; (iii) dredging and dredge spoil disposal; and (iv) construction dewatering and foundation underdrain discharge. During each of these operations, some sediment will be suspended in the water column. In addition to the resulting turbidity, some minor releases of metals and nutrients may occur, possibly affecting the natural biota or water users.

The benthic community in the project area is dominated by such pollution tolerant species as Capitella capitata and Polydora ciliata, benthic worms, based upon the extensive data gathering investigations of the Third Harbor Crossing Draft Environmental Impact Statement (December 1983). These species are opportunistic, and recolonization of dredged areas typically is completed within 6 to 12 months. Motile organisms--specifically finfish--swim away from the immediate area of the turbidity plume. The amount of disturbance from this project will be similar to storm-induced turbidity and will not be toxic to the biota.

To estimate the potential impacts that might result from release of sediment contaminants to the water column, elutriate analyses were conducted on the sediments. In this analysis, samples of sediment from the project area were mixed with seawater to simulate the effects of suspension during dredging or pile driving operations. Chemical analyses were then conducted on the water and compared to background water quality conditions to determine the amount of chemical release.

The two sediment sampling locations are shown in Figure IV-41 as E-1 and F-1. Elutriate analyses for Sample Location E-1 were completed on materials from two depths, as shown in Figure IV-48, with analysis conducted on surface materials only at Location F-1. The fourth column of Figure IV-48 provides background, or receiving water quality at the site. Comparison of the elutriate sample data with that of background water quality indicates minor releases of metals and nutrients. However, for many of the constituents tested, the concentrations in the elutriate were equal to or lower than those in the receiving waters at the project site.

Figure IV-48

Elutriate Analysis of Marine Sediments

WATER QUALITY LABORATORY
ANALYSIS REPORT

PROJECT: ROWES WHARF
PROJ/NO: 148 ELUTRIATES, RECEIVING WATER

244 SECOND AVENUE
WALTHAM, MA 02154
617/890-3737

STATION:		E-1	E-1	F-1	R.W.
DATE OF ANALYSIS:		1/17/84	1/17/84	1/17/84	1/17/84
SAMPLE #:		7349E	7350E	7351E	
TYPE OF ANALYSIS:		ELUTRIATE	ELUTRIATE	ELUTRIATE	REC. WATER
SEDIMENT DEPTH:		0-12"	20-44"	0-18"	
ARSENIC	mg/l	(0.03	(0.03	(0.03	(0.03
CADMIUM	mg/l	.023	.025	.031	.029
CHROMIUM	mg/l	(0.01	.006	(0.01	.006
COPPER	mg/l	.035	.021	.018	.003
LEAD	mg/l	.782	.777	.780	.853
MERCURY	ug/l	.3	.2	.2	.3
NICKEL	mg/l	.162	.162	.218	.163
VANADIUM	mg/l	.01	.073	.01	.01
ZINC	mg/l	.053	.021	.022	.051
P/TOTAL	mg/l	.040	.36	.40	.07
N/AMMONIA	mg/l	6.60	20.0	3.98	.351
TKN	mg/l	6.20	12.4	3.47	.026
O&G	mg/l	(2.0	(2.0	2.0	.407
PHENOLS	ms/l	.041	.029	.039	36.4
BOD	ug/l	2.0	3.5	3.8	9.16
COD	ug/l	968.45	1110	988	(2.0

CARLTON L. NOYES

During demolition, installation of the bulkhead and piles, and dredging, the amount of disturbance to Category 3 sediments will be limited due to the choice of construction techniques:

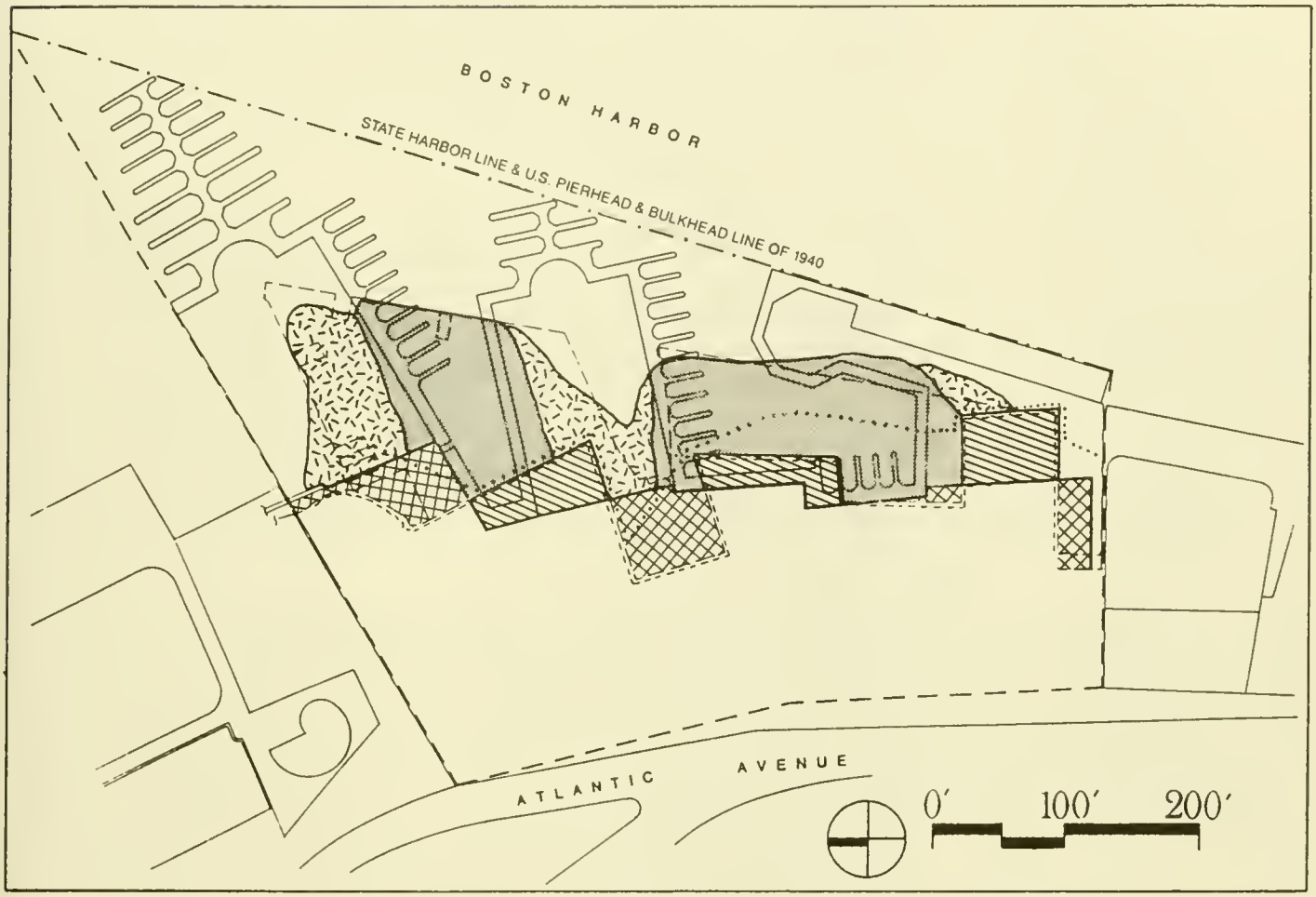
Demolition and removal of existing seawalls, timber deck and piles. This activity will be accomplished by using both land and water-based demolition equipment. The existing timber piles (approximately 2,600 piles) will be removed entirely from the sediment rather than being cut at the mudline. Where existing fill and granite seawalls extend seaward of the new bulkhead, such material will be excavated by backhoe from the landward side. Pile removal will occur within a floating boom and silt curtain to minimize releases to the Harbor of flotsam and sediment, respectively. No significant environmental impacts will occur as a result of this activity.

Installation of new bulkhead and piles. The new steel sheet pile bulkhead will be driven through existing historic fill and sediment. In order to eliminate potential obstructions, such as old granite foundations and seawalls, the entire alignment of the new bulkhead will be pre-excavated using land-based backhoes and temporarily backfilled with clean granular fill. The new steel sheet pile bulkhead will be driven through the clean fill, and the temporary fill seaward of the new bulkhead will be removed by land-based backhoes. The steel H-piles that will support the Wharf structures are nondisplacement piles, which will be driven, not jetted, into place, resulting in minimal disturbance of marine sediments and associated turbidity.

Dredging and dredge spoil disposal. Dredging operations will have the most significant potential for impact. Dredging will be accomplished by means of a barge-mounted clamshell dredge behind silt curtains. A bottom-dumping barge will be used to transport the dredge spoil to the Massachusetts Bay Foul Area for disposal. The marina areas will be dredged to a depth of -10 ft mlw, and there will be some additional dredging to a depth of -7 ft mlw to allow access for the construction barges. These areas are shown on Figure IV-49 and total appoximately one acre from which 9,000-10,000 cy of material will be taken. Dredging is expected to require two one-month periods scheduled for fall of 1984 and late spring of 1985.

Figure IV-49

Dredging & Excavation Plan



Dredging to -10 ft mlw
Dredging to -7 ft mlw
Excavated Land Area
New Bulkhead Location
Existing Mean High Water Mark
Existing Mean Low Water Mark
Filled Land Area

Estimates of the area where there will be increased levels of suspended solids have been made by reference to current directions and velocities. Data on tidal currents are available for a location in front of the Rowes Wharf site and are considered representative of conditions at the site. Average tidal velocity is weak, 0.08 feet per second.

Based on the 0.08 feet per second rate from the current meter station, it is estimated that sediments suspended during dredging will travel approximately 1,800 feet on an ebb or flood tide. On the flood tide, some of the suspended solids will travel into the Fort Point Channel to the area where Hook Lobster Company has its seawater intake. It is also possible that on the ebb tide, some suspended solids would be dispersed to the vicinity of the seawater intake for the New England Aquarium. Concentrations of suspended solids in the plume are expected to be low, with less than 5 mg/l at the end of the plume.

The New England Aquarium filters its water and, therefore, no problems are anticipated at that location. While the concentrations of suspended solids near the Hook Lobster Company intake are not anticipated to cause problems with water use, a silt curtain will be suspended around the entire dredge area, and the operation will be monitored. Should the monitoring reveal problematic turbidity levels near Hook's intake, further mitigation measures that will be considered include suspending a silt curtain around the intake, modifying the intake with the possibility of using filtration systems, and dredging on the ebb tide, if feasible.

Construction dewatering and foundation underdrain system. Minimal dewatering operations are expected to be required during excavation for the main foundation. Water removed from the excavation will be discharged to the Harbor behind silt curtains, and is anticipated to be less than 60,000 gallons per day. As the underlying sediment is native, uncontaminated material (either Boston blue clay or glacial till), the only water quality concerns will be in terms of suspended solids rather than any chemical or nutrient increase.

Impact will be further limited by two construction practices. First, the entire area to be excavated will be enclosed through slurry wall construction. Thus, during the excavation process, there will be minimal lateral seepage of groundwater. Only the water that accumulates from precipitation or that which seeps up from the bottom of the excavation will have to be removed. Second, the use of "up-down" construction techniques will minimize the amount of precipitation that enters the excavation area. Third, the dewatering discharge will be made behind silt curtains. These curtains will reduce current velocities, allowing suspended material to resettle before being transported any significant distance.

A permanent foundation underdrain system will be provided to collect groundwater seepage for discharge to the Harbor. The estimated maximum discharge is 60,000 gallons/day of uncontaminated groundwater. No adverse water quality impacts are anticipated.

Effects On Circulation. The piles for the proposed structure will be spaced at 18 to 24 feet on center. No deterrent to water circulation under the structure will result. In comparison with existing conditions, the new piling will be spaced at much greater intervals. Overall, circulation in and around Rowes Wharf is expected to improve, resulting in less accumulation of sediment than is presently occurring.

Excavation and Disposal of Upland Materials. The 125,000-150,000 cy of upland materials to be removed to accommodate the below-grade garage will be excavated from within the limits of the permanent reinforced concrete slurry wall. Once the concrete slurry wall and caissons are in place, construction of the garage and the building structure will occur simultaneously. This construction technique--called "up-down" construction--entails mining of successively deeper levels of the garage as each below-grade level is finished. As a result, the amount of water entering the excavation area will be limited: the slurry wall will minimize lateral seepage and up-down construction will minimize stormwater entry from above. Excavate material will be in an essentially natural state as it is removed from the site for disposal.

Given the high chloride content of the upland materials described previously in this Section, the bulk excavate must be disposed of at a coastal landfill site that drains directly to a marine environment. The proponent has been working closely with the DEQE, Office of Solid Waste, concerning the alternative sites and conditions for disposal of this material. The sites currently being considered include the America East property in Lynn, the DeMateo Landfill in Saugus, or the Squantum Point Landfill in Quincy. Neither the excavation process nor the disposal of excavate from this project is expected to have any significant adverse environmental effects.

MITIGATION MEASURES

Mitigation of water quality impacts from demolition, pile driving, dredging, and dewatering can be accomplished primarily through the selection of specific construction practices. Many of these practices have been described previously in this Section because they are an integral part of the construction plan and critical to evaluating its impact. A summary of activities and mitigation practices being considered as part of the plan follows:

Demolition. The area to be demolished will be surrounded by floating booms to ensure that floating debris does not enter into navigable waters of Boston Harbor. Existing timber piles will be removed entirely from the sediment rather than being cut at the mudline.

Dredging. Dredging will be performed by means of a clamshell dredge behind suspended silt curtains and a floating boom. Water quality will be monitored during dredge operations, with particular attention given to turbidity levels near the Hook Lobster Company seawater intake. If warranted, additional mitigation measures will be considered incuding silt curtains around or modifications to Hook's intake, intake filtration systems, and dredging on the ebb tide, if feasible.

Pile driving. The permanent bulkhead will consist of structural steel sheet piling driven largely through existing fill; thus, water quality impacts should be minimal. The steel H-piles supporting the wharf structures are small displacement piles that will be driven, not jetted, resulting in minimal disturbance of marine sediments and associated turbidity.

Dewatering. The amount of construction dewatering will be greatly reduced due to the use of slurry wall construction techniques that will effectively eliminate lateral groundwater seepage into the garage excavation. In addition, early construction of the ground floor slab over the excavation, made possible by the "up-down" method of construction, will greatly reduce rainfall accumulation in the excavation. Any dewatering discharge will be conducted behind silt curtains to allow suspended material to settle before being transported any significant distance from the discharge point. Mitigation of foundation underdrain discharges will not be needed since the discharges will be uncontaminated groundwater and will have no significant adverse environmental impacts.

Water-Related Activities

INTRODUCTION

Historically, Rowes Wharf played an important role in maritime use of the Harbor for military, cargo, and passenger service. In the early 1880s, packet lines and importers of European produce operated from the Wharf. By the mid-1880s, the area had become a steamship center. While military and cargo operations are now conducted in other locations, passengers still board and disembark from commuter and excursion boats that dock daily at Rowes Wharf. The City's long-range goals for the Harbor recognize the importance of continuing these ferry services at Rowes Wharf and call for upgrading their accommodations.

In addition to commercial boating, this area of the Harbor, with its access to Boston's downtown waterfront, is becoming increasingly attractive to recreational boaters. This growing popularity has created a demand for more long-term moorings for local residents and some short-term tie ups for sailors passing along the coast. Special Anchorage Areas in the navigable waters beyond Rowes Wharf provide some public mooring spaces but do not allow easy access to the shore for mariners who want to take advantage of the City's waterfront attractions. Because of its location, Rowes Wharf has been identified as an appropriate site for recreational marine services, including a public dinghy dock and a marina with space for transient boaters.

The proponent is committed to developing and maintaining maritime facilities on Rowes Wharf that enhance the Harbor's water transportation program. In order to develop a responsible building program and design for water-related facilities, the proponent authorized a research program aimed at better understanding water transportation requirements. The study of facility needs and management practices was augmented by an extensive survey of ferry terminal operations throughout the state and country. As part of this study, interviews were conducted with key persons and agencies involved in the Harbor, and weekly meetings of the Water Transportation Task Force are being attended. Principle contacts have been:

Boat Operators

- Mass Bay Commuter Services, Inc. - Charles English
- Mass Bay Lines, Inc. - William Spence
- Harbor Crossing Company - Arthur Casey
- Bay State Spray & Provincetown Steamship Co. - Richard Nakasian
- Boston Harbor Commuter Services - Dana Goodall

City Officials

- Boston Redevelopment Authority - Phil Ziegler and Shirley Muirhead
- Boston Harbormaster - Sergeant Eric Hahn
- Boston Traffic and Parking Department - Phillip Caruso

State Officials

- Department of Public Works - Martha Reardon
- Department of Environmental Management - Kathy Abbott
- Executive Office of Transportation and Construction - Ann Hershfang and Cecile Papazian
- Department of Environmental Quality Engineering - Roderick Gaskell
- Mass. Bay Transit Authority - Joseph Cahill and Karla Karash
- Massport - Alice Boelter and Anne Meyers

Federal Officials

- National Park Service - Vince Lombardi
- Urban Mass Transit Authority - Patricia Cass

Other

- Boston Educational Marine Exchange - Carl Koch
- The Boston Harbor Associates - Thomas Ennen

In addition, the following operations managers of ferry and maritime facilities were contacted and interviewed:

Ferry Services

- San Francisco Golden Gate Ferry, San Franciso, California
- Red and White Lines, San Francisco, California
- Department of Transportation Bureau of Ferries, New York, New York
- Fire Island Ferries, Bay Shore, Long Island

- Woods Hole Steamship Authority, Woods Hole, Massachusetts
- Circle Lines, New York

Ports

- Port of Miami, Florida
- Port of Dover, England

The ferry terminal use program and management plan, developed as a result of these discussions, are outlined later in this Section.

The incorporation of water-dependent uses at Rowes Wharf will increase public access to the water and add to the visual texture of the Harbor. The proponent supports the City's desire to increase the level of water-related activities at Rowes Wharf and is committed to maintaining a ferry terminal, marina, and public dinghy dock on the site.

DESCRIPTION OF THE ENVIRONMENT

Rowes Wharf is located within non-navigable waters, designated for general anchorage and commonly referred to as the magenta zone. Directly beyond the eastern boundary of the magenta zone, in navigable waters, are three designated Special Anchorage Areas. Two areas lie off the northern end of the Rowes Wharf site; a small third area is located just west of the entrance to Fort Point Channel. These Special Anchorage Areas were established in 1982 by the U.S. Coast Guard to provide an alternative to random, isolated anchoring of pleasure boats throughout the inner Harbor. Their locations were defined to allow reasonable access to the existing ferry facilities at Rowes Wharf. In these Anchorage Areas, boats under 65 feet in length do not have to carry or display anchor lights, which saves the expense of batteries and generators.

The Boston Harbor Sailing Club, headquartered in Harbor Towers adjacent to the Rowes Wharf property, was an active proponent of these Anchorage Areas and has many boats moored in the northern areas. For transient boaters who anchor in these Special Anchorage Areas, there is no easily accessible public dinghy dock at which they can secure small crafts. Beyond the Special Anchorage Areas, and approximately 500 yards out from Rowes Wharf, runs the Boston main ship channel.

While recreational and commercial boating is established in the area, the only marine activity presently happening at Rowes Wharf is the arrival and departure of commuter and excursion boats. The ferryboat operators presently using Rowes Wharf include Mass Bay Commuter Services, Inc. (MBCS), which operates one high-speed commuter boat; Boston Harbor Commuter Services (BHCS), which also operates a high-speed commuter boat and has recently purchase another boat; and Mass Bay Lines, Inc. (MBL), a four-ferry operation which primarily provides excursion and charter services as well as limited weekday commuter runs. The commuter boats operate year-round, between Hingham on the South Shore and Rowes Wharf, while excursions run primarily during the summer.

MBCS's and BHCS's sublicense agreements with the Massachusetts Executive Office of Transportation and Construction (EOTC) allow the use of Rowes Wharf for "docking commuter vessels to allow commuter passengers to embark and disembark." MBL's "use and occupancy agreement" is with the Boston Redevelopment Authority (BRA).

Structures associated with these operations include four trailers for administrative, ticketing, and passenger-waiting functions. Until February 1984, with the addition of a 600 square-foot trailer by the State Department of Public Works, passengers at Rowes Wharf had been accustomed to waiting outside for their boats.

Finally, a newly-established dockage area has been constructed at 400 Atlantic Avenue. It is presently used by the Harbor Crossing Company to provide ferry commuter services to Quincy.

PROBABLE PROJECT IMPACTS

No-Build

Currently, Rowes Wharf is underutilized, with portions barricaded from the public due to its dilapidated state and deteriorating piers. The Wharf's condition already prevents it from being a safe place for pleasure boats to tie up. If continuation of the present use is assumed, with no Wharf reconstruction or improvement to existing structures, the ongoing deterioration of the site would eventually preclude its long-term use as a ferry embarkation/disembarkation point.

Proposed Project

Assuming implementation of the development proposal, commercial and recreational uses will be accommodated by an upgraded ferry terminal and loading area; a marina containing approximately 50 slips of which half are reserved for transient/public boaters; and a public dinghy dock. The piers will be reconstructed, eliminating a current safety hazard and increasing their usefulness for all the proposed marine activities.

Ferry Terminal

Ferry Terminal Facilities. A 2,500 square-foot enclosed ferry terminal for commuter and excursion boats, with potential for expansion to 8,000 square feet in the future, will replace the trailers that currently house the landside ferry operations. Provided at the southern edge of the site, the terminal will have a full view of and permit direct access to the ferryboats. Facilities will include seating, a public telephone, and a shared ticketing and information counter which will accommodate three to four operators. If there is sufficient demand, luggage-handling facilities will also be provided. Additional space in the south wharf will be available for terminal expansion and for offices, storage, and employee facilities as required by the operators.

Two gangways, one on the northern end of the dock and the other on the southern, will provide access to the dock area. In response to input from the Water Transportation Task Force and to ensure the full comfort of passengers, covered gangways and protected walkways are also being considered. Entrance to the dock will be from the ferry terminal. To ensure smooth passenger flow, the separate gangway on the southern end of the dock will be reserved for exiting passengers. If necessary, entrance to the dock via this gangway may be permitted during peak hours.

The proposed dock is of substantial size and will be built consistent with sound engineering practices. Fenders, designed to absorb impact, will protect the ferryboats and the well-lit dock will have water and electricity available to the operators. Up to three boats will be accommodated simultaneously and, in contrast to the current fixed-level piers, the floating dock will provide more flexibility for boat operators.

According to marine experts, this type of dock is preferable as it ensures a fixed distance vis-a-vis the boat deck and the dock since this distance is not contingent on the tide. Consequently, a permanent set of steps or portable stairs can be used to access the preferred rather than "tide-necessitated" point(s) of entry/exit to the boat.

Boat layover will be allowed at the dock provided it does not compromise boat loading and unloading and general vessel turnover. Should additional dock space be needed, the proponent will work closely with the appropriate agencies/individuals to establish expansion strategies. For the present, the proponent has initiated discussions with the developer of 400 Atlantic Avenue about the possibility of establishing a continuous dock from the proposed Rowes Wharf ferry dock to the 400 Atlantic dock, adding approximately 130 linear feet. Floating docks could also be utilized to accommodate increased seasonal traffic.

Ferry Terminal Management. The proponent will operate the terminal. As part of the overall management plan for the Rowes Wharf project, the proponent has identified the need for a maritime facilities manager who will oversee the operation of the ferry terminal, marina, and public dinghy dock. Rowes Wharf management will maintain the terminal building and dock area, which includes ensuring the facility is clean and in good repair, and providing on-site security. Administrative functions necessary for the operation of the facility, and major repairs and capital improvements will also be the responsibility of Rowes Wharf management.

In addition, as needed, the maritime facilities manager will work with the boat operators and public transportation officials to coordinate commuter schedules as well as intermodal transportation opportunities. This will include ensuring information/schedule links between the ferryboats and public transportation (MBTA, commuter rail), vanpools, and taxis.

The proponent plans to establish agreements with ferryboat operators and will give preference to current site users. The proponent is currently researching the range of alternatives for establishing charges for year-round, seasonal, and special events users. These

charges will be based on market comparables and cost of service considerations. The proponent will work with EOTC and BRA to develop agreements consistent with City and state policy for waterborne transportation and will take into account the operators' needs for long-term planning of their operations.

Basis for Ferry Terminal Program. The following findings guided the design program for this terminal facility:

- Terminal space should be in full view of ferryboats and as close as possible to the loading area.
- Enclosed areas are only needed for commuter services during adverse weather. Excursions are only active in good weather and do not require enclosed/heated space.
- Standards for ferry waiting areas should be slightly more generous than for rapid transit stations. Approximately seven square feet per passenger is recommended for the Rowes Wharf terminal (versus a typical five square feet per person for other heavily-traveled transit).
- Facilities needed in addition to a waiting area should include a small ticketing booth and storage/ employee area.

These guidelines, in conjunction with an analysis of existing ferry operations and discussions with local operators, interest group representatives, and City and state officials, resulted in the following program assumptions for Rowes Wharf:

- Up to three ferry-boat operators.
- PM peak load of 600 passengers (i.e., approximately four capacity-loaded boats within an hour period).
- Peak at two boats embarking at same time (with capacity of approximately 150 passengers each).
- Maximum of 300 passengers waiting.
- 300 passengers at 7 square feet per person equals 2,100 square feet of terminal space.

Therefore, it is assumed initially that terminal space needs will not exceed 2,500 square feet during any peak period. An additional 5,500 square feet will be reserved for future expansion of the terminal as needed.

Construction Impacts and Mitigation Measures. During construction of the Rowes Wharf project, all commuter and excursion boat services presently operating on site and at 400 Atlantic Avenue will be coordinated with construction activities so that the operators can maintain their present levels of service. As specified in BRA's license and EOTC's sublicense agreements with the existing operators, the "property is currently subject to intensive development activity (and) may require the Licensee to relocate activities...to different locations within or outside the Rowes Wharf property...." The proponent has proposed a phased ferryboat relocation plan for the construction period, which is currently being reviewed by operators, the licensors, and the developer of 400 Atlantic Avenue. Construction is planned from south to north on the site in order to make the new ferry dock available to operators by the spring of 1985. The first phase of construction begins in late 1984 at the southern end of the site. During this phase, the commuter ferries operating from Rowes Wharf will be able to continue their present docking arrangements. During the winter, the excursion boats will be stored at the Perini Corporation's marine yard, with all required utilities, as arranged by the proponent with the agreement of the operator. Because the presence of the construction barge at the southern end of the site will interfere with the ferry operation at 400 Atlantic Avenue, it is being proposed that the floating dock from 400 Atlantic be relocated to the northern end of Rowes Wharf is a manner that will allow the operator to maintain the present level of service.

In early 1985, construction operations will move to the northern end of the site, making it necessary to move the commuter ferryboats southward. The relocation site under consideration is the 400 Atlantic Avenue Wharf, with the possibility of adding a second floating dock to increase the landing area if required.

The construction of the permanent ferry terminal pier at Rowes Wharf will be completed for use by both commuter and excursion boats by the spring of 1985.

In conclusion, the Rowes Wharf Development will not only retain ferry uses on the Wharf, but it will expand and improve related facilities for the operator as well as the passenger.

Marina

To develop the waterfront as a recreational and tourist center, the City is interested in providing more secure overnight facilities within the inner Harbor for private pleasure craft. In response, the proposed project includes a marina, containing approximately 50 slips, for sailing and power boats ranging from 20 to 40 feet in length. One-half of the slips will be available for use by the transient general boating public, and the remaining slips will be available to residents of the project and other long-term users. A floating dock system anchored by pilings will extend from the tips of the proposed finger piers. In addition, finger docks will be clustered within inlets formed by the piers. Water, telephone, and electrical hook-ups will be provided at each slip.

Public Dinghy Dock

The public dinghy dock will be located in the inlet between the north and central piers for protection from wave action and to provide easy access to the Special Anchorage Areas.

Navigational Issues

In 1968, the U.S. Government established a portion of the Boston Waterfront as non-navigable waters. The boundaries of this area are roughly defined as the westerly sideline of Atlantic Avenue/Commercial Street (on the west), the U.S. Coast Guard Station at the foot of Hanover Street (on the north), the State Harbor Line and U.S. Pierhead and Bulkhead Line of 1940 (on the east), and the northerly side of Northern Avenue (on the South) (see 33 U.S.C.S. s.59f). This area is commonly referred to as the magenta zone after the color used to identify it on the National Oceanic and Atmospheric Administration's Charts. The Draft EIR indicated that portions of the ferry pier and marina extended into navigable waters. Due to extensive comments about this configuration, the site plan has

been modified so that all structures are now within the State Harbor Line and U.S. Pierhead and Bulkhead Line of 1940 as shown in Figure IV-50. See Appendix 6, Notification of Project Changes, for a detailed discussion of this site plan modification.

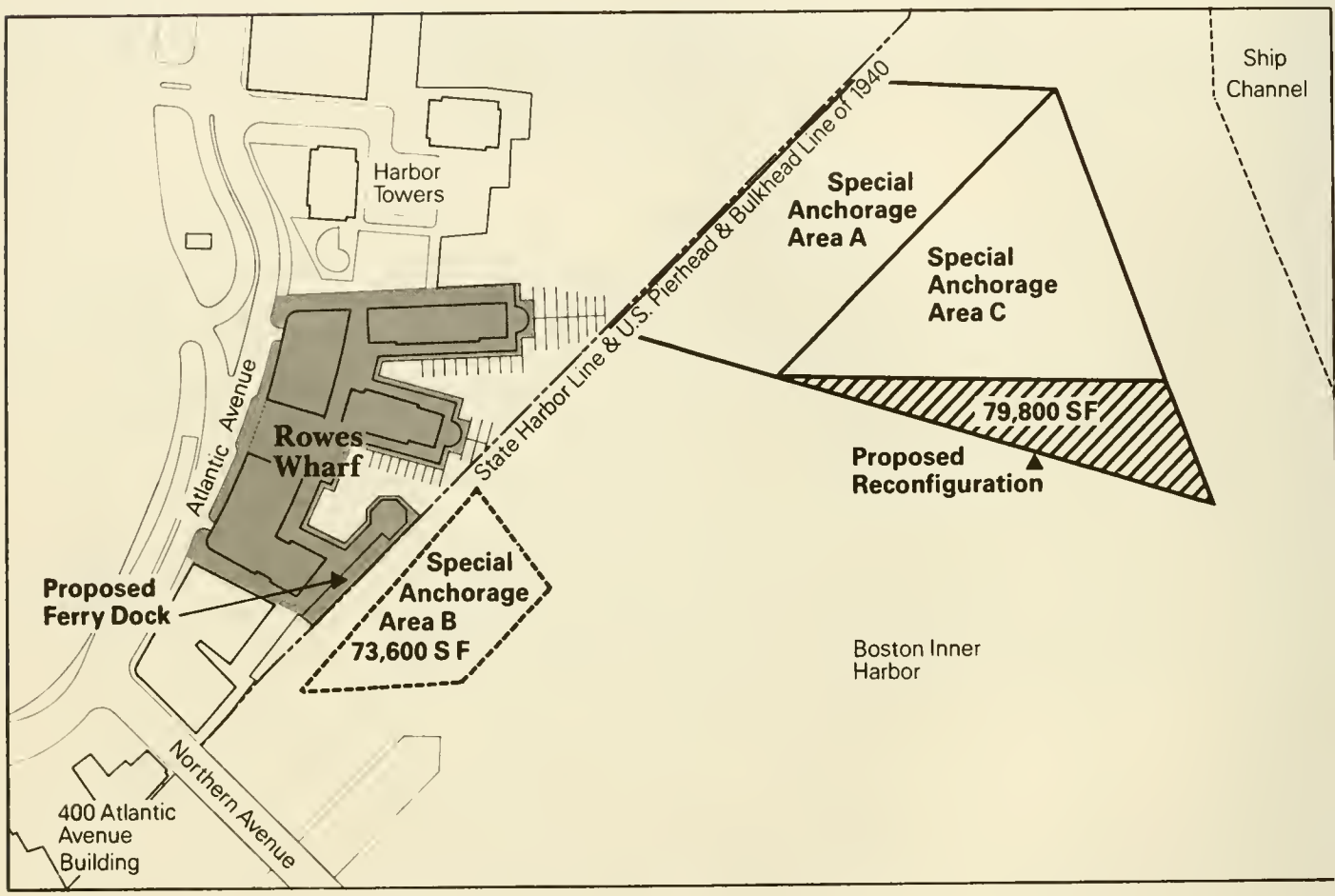
Special Anchorage Areas

The placement of the Special Anchorage Areas, two at the northern end of Rowes Wharf and one at the southern end, creates a fairway through which the ferryboats must navigate to reach their present landing area at the more northern end of the wharf. The Anchorage Area boundaries were established partially in response to comments from the ferry operators who were concerned about navigability through the fairway.

In the proposed development, the ferry facilities would be relocated to the southern end of the property. This relocation will create a navigational conflict with the Special Anchorage Area B, located off the eastern boundary of the site at the southern end. Area B is directly in the path of the ferryboats' access to the south wharf/ferry pier, which would make it extremely difficult, if not impossible, for ferryboats to maneuver around anchored boats and/or moorings in the area. Because the majority of advocates of the Special Anchorage Areas expressed particular support for the two northern Anchorage Areas, and because ferry service improvement and expansion has been a long sought goal of waterfront organizations and City policies, the proponent, in consultation with the U.S. Coast Guard and the Boston Harbormaster, has proposed the reconfiguration of Anchorage Area B adjacent to the southern boundaries of Anchorage Areas A and C (see Figure IV-50). This reconfiguration retains the total square footage specified for the three Anchorage Areas, places Anchorage Area B in closer proximity to the public dinghy dock being provided as part of the development, and creates more separation between recreational and commercial boat activities in the area. Since the City operates the Anchorage Area, the request for reconfiguration will be prepared by the Harbormaster using the plan presented in Figure IV-50. The request will go to the U.S. Coast Guard who will follow the federal procedure for establishing Special Anchorage Areas.

Figure IV-50

Proposed Reconfiguration of Special Anchorage Area 'B'



Boston Main Ship Channel

The proposed project will have no impact on the Boston main ship channel. The channel, which is located approximately 400 yards from the proposed project, was recently examined for potential impacts due to the creation of the Special Anchorage Areas. The U.S. Coast Guard, in their environmental assessment of the proposed Anchorage Areas prepared in February 1981, stated: "The larger area's channelward limit is approximately 100 yards from the edge of the Boston main ship channel. In this instance the 100 yard separation from the edge of the ship channel is considered well removed from the main ship channel. It is also considered that this anchorage will neither endanger or be endangered by the general navigation. This is based on past experience and consideration of the input from the marine community."

In the proposed Rowes Wharf project, all docked boats will be separated from the ship channel by Anchorage Areas and therefore should have no significant impact on the channel. The proposed reconfiguration keeps the extended eastern boundary of the Anchorage Areas at the same distance as now exists. Questions of traffic across the channel are being addressed by the Harbormaster and the Coast Guard in their discussions concerning enforcing safe boating practices.

MITIGATION MEASURES

As noted above, the proponent is committed to working with the appropriate public agencies and community groups to adjust Anchorage Areas and fairway widths so that objectives of ferry services, the public dinghy dock, and transient and residential marina slips are met.

Construction

INTRODUCTION

This Section describes the construction techniques selected in response to the special characteristics of this project and reiterates the discussion of probable short-term construction impacts, which are covered in greater detail in other Chapter IV sections.

Construction is anticipated to begin in the last quarter of 1984, with completion in 1987. Some construction activities will happen landside, while others will occur waterside from a barge helping to reduce the truck traffic at the site. Operations have been scheduled to move from south to north on the site in an effort to establish ferry services at the new ferry pier as soon as possible.

As stated earlier, the Rowes Wharf project is to be undertaken on land now owned by the Boston Redevelopment Authority to be made available for redevelopment. The Boston Redevelopment Authority's title to a portion of the northerly end of the project site, specifically in the location of the north wharf, is clouded by a claimant under an old agreement which the Boston Redevelopment Authority has declared to be null. Both the Boston Redevelopment Authority and the project proponent are of the opinion that such cloud will be removed seasonably--by exercise of eminent domain powers if need be--to permit completion of the entire project, including the north wharf building, within the project completion schedule. In the unlikely event that the Boston Redevelopment Authority is unable to deliver good title to this disputed portion of the site, thus making construction of the north wharf building impossible, the balance of the project would nevertheless be constructed and would contain the permanent public amenities of the nature described herein.

MAJOR CONSTRUCTION TECHNIQUES

Given the waterfront location and the marine subsurface conditions of the site, the proponent has retained as heavy/marine contractor the Perini Corporation which has extensive experience in heavy marine and foundation construction and related mitigation measures.

Following an extensive investigation to determine the nature and extent of existing site conditions, the proponent, in consultation with the contractor, plans to use three major innovative construction techniques to shorten the building period, reduce construction

related traffic, and lessen the impacts on water quality and nearby structures. Brief descriptions of these techniques follow.

- Slurry walls are rigid, impermeable reinforced concrete foundation walls, which provide the lateral support during excavation and become the permanent foundation walls. This system minimizes water seepage into the foundation excavation, eliminates risk of settlement of adjacent structures, and reduces truck deliveries of building materials.

- The "up-down" method of construction--involving the installation of permanent deep-foundation elements from existing grade early in the foundation construction process and the subsequent casting of concrete floors at grade--will allow the erection of the building superstructure simultaneously with the construction of the below-grade parking garage. This method shortens the overall construction period, eliminates the need for tie-backs, and reduces noise and dust. In addition, early completion of the ground floor will reduce the rainfall entering the excavation, thus reducing the dewatering during construction and potential impacts to surrounding waters.

- The use of preassembled elements where appropriate (such as structural steel framing and prestressed, precast concrete wharf systems) reduces the quantity of labor and bulk materials that must be delivered to the site and decreases the on-site duration of critical construction activities.

PROBABLE PROJECT IMPACTS AND MITIGATION MEASURES

Potential short-term impacts due to construction, as well as possible mitigation measures, are addressed as appropriate in the traffic, air quality, water quality, and water-related activities sections of this Chapter. Following is a collective summary of the probable effects and suggested mitigation measures.

Traffic and Parking

All roadway access to the site is via Atlantic Avenue. This roadway will be affected for periods of the project construction by truck trips for waste removal,

building material deliveries, and in connection with phases of the garage wall construction. Chapter IV: Traffic and Parking presents an estimated breakdown of truck trips.

In addition to selecting construction techniques and approaches that help reduce truck trips to the site, the proponent has developed a traffic control plan that maintains sufficient vehicular and pedestrian capacities throughout construction for the portion of Atlantic Avenue adjacent to the Rowes Wharf site (see "Traffic and Parking"). This plan has been initially reviewed and approved by the Traffic and Parking Department of the City of Boston.

Water Quality

Possible effects on water quality from demolition, dredging, pile driving, and dewatering activities have been thoroughly considered in Chapter IV: Water Quality, Dredging, and Filling. The slurry wall and "up-down" construction techniques will help mitigate the impacts on water quality by respectively eliminating ground water seepage and reducing rainwater accumulation in the excavated area. Additionally mitigation measures already have been specified as part of these procedures: floating booms to retain debris, the complete removal of existing timber piles, the use of a tight clamshell dredge, dredging and dewatering behind silt curtains, continual monitoring of water quality during dredging, and driven rather than jetted piles to lessen turbidity.

Air Quality

There could be a short-term impact on air quality from fugitive dust emissions during construction. The choice of the "up-down" construction technique will greatly reduce the area subject to wind erosion because the ground floor will be put in place early and excavation will proceed using mining techniques. Those areas that are subject to wind erosion will be watered to prevent excessive dust emissions.

Water-Related Activities

Although the construction schedule is planned so that the ferryboats operate from the new, permanent facilities as soon as possible, there will be some relocation necessitated by activities occurring at the southern end of the site during the last quarter of 1984 and the first half of 1985. A plan that allows maintenance of present ferryboat operations from Rowes Wharf is detailed in Chapter IV: Water-Related Activities.

Coordination with Nearby Construction Projects

During the construction period for the Rowes Wharf Development, two other projects are scheduled to occur nearby: (i) International Place at Fort Hill Square, proposed by the Fort Hill Square Associates, and (ii) the New East Side Interceptor in Atlantic Avenue, proposed by the Boston Water and Sewer Commission. The proponent has met with representatives of both of these projects to coordinate construction schedules.

International Place

In a meeting with representatives of International Place, it was indicated that the probable start date for Phase I of their project is the fourth quarter of 1984, which coincides with the Rowes Wharf project's anticipated start date. Construction activities that will occur contemporaneously between 1985 into early 1986 for both projects include demolition, excavation, foundation construction, and erection of superstructures and exterior cladding.

The potential areas of environmental impact of these activities include traffic and parking, noise, air quality, site hydrology, and the impact on local businesses. Based upon an initial review of these issues by each developer's environmental consultants, it was determined that, except for traffic and parking, and impact on area businesses, the other potential impacts were all site specific, would not create conflicts between the projects, and should properly be independently addressed by each developer within the confines of each project site and operation.

With regard to traffic and parking, the truck traffic required for both projects may use the same access to the Central Artery (Purchase Street ramp southbound and the Northern Avenue ramp northbound) and the same exits (Northern Avenue and High Street). The International Place developer is preparing a construction staging and logistics strategy that will mitigate potential impacts from the convergence of traffic on Purchase Street.

Both developers are considering locating construction worker parking in the Fort Point Channel area, with shuttle service to the sites. The two project proponents are discussing the possibility of coordinating the shuttle service.

With regard to impact on area businesses, the only impact identified was an increase in food service demand from onsite construction workers. This may encourage the development or expansion of existing coffee shops and food service establishments in the area.

The proponent has made arrangements to hold a preconstruction meeting in September 1984 with the selected contractors for both projects to review coordination plans.

New East Side Interceptor

The proponent has initiated discussions with the Boston Water and Sewer Commission to coordinate installation of those portions of the New East Side Interceptor adjacent to the Rowes Wharf site. The objective of this coordination plan is to minimize construction period impacts on Atlantic Avenue.

V Measures to Mitigate Adverse Effects

Provided here is a summary of mitigation measures which are proposed to minimize the potential adverse effects of the Rowes Wharf development. A more detailed discussion of these measures is included in each of the impact categories addressed in Chapter IV. When mitigation measures require actions by public agencies, the proponent is committed to working cooperatively to achieve these objectives. Mitigation measures for construction impacts are included under appropriate headings. No mitigation measures would be associated with the No-Build Alternative.

TRAFFIC AND PARKING

- Eliminate parallel parking along the site frontage on Atlantic Avenue, providing drop-off space for taxis and others arriving at the site.
- Install a signalized pedestrian crossing on Atlantic Avenue.
- Restrict peak-period parking along Atlantic Avenue north of the site.
- Encourage vanpool and carpool programs to reduce vehicle trips.

AIR QUALITY

- Eliminate parking along both sides of Atlantic Avenue at the intersection with East India Street during the afternoon peak period (4 to 6 PM).
- Water the areas subject to wind erosion to prevent release of fugitive particulates into the air during construction.
- Continue State Inspection and Maintenance Program.

VISUAL QUALITY AND URBAN DESIGN

- Continue intensive design-review process with the Boston Redevelopment Authority and the Boston Society of Architects as required under the land disposition agreement.

WIND

- No adverse impacts anticipated based on extensive studies.

SHADOW

- No adverse impacts anticipated based on a computer analysis.

WATER QUALITY, DREDGING, AND FILLING

- Place slurry wall around area to be excavated to eliminate lateral water seepage and reduce volume of water to be removed from construction area.
- Use driven piles, silt curtains and floating booms, and sequencing during construction.
- Place sheet-steel retaining walls in front of open water area to be permanently filled to preclude turbidity-producing activity from affecting Harbor waters, to the extent feasible.
- Enclose entire dredge area within silt curtains and monitor suspended solid levels during anticipated two one-month dredging periods, with provision to consider further mitigation measures including silt curtains around Hook Lobster Company's seawater intake, filtration systems, and dredging on the ebb tide.
- Coordinate with the Massachusetts Department of Environmental Quality concerning the disposal of excavated materials.

WATER-RELATED ACTIVITIES

- Work with Boston Harbormaster, U.S. Coast Guard, and other interested parties concerned with water activities in Boston Harbor to reconfigure Special Anchorage Area B so that objectives of ferry service and recreational boating can be met.

CONSTRUCTION

- Select construction techniques/approaches to help reduce traffic volume on Atlantic Avenue and to lessen impacts on water quality and nearby structures.
- Implement traffic control plan along Atlantic Avenue during construction periods.
- Implement phased ferryboat relocation plan to accommodate ferry services during construction.

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